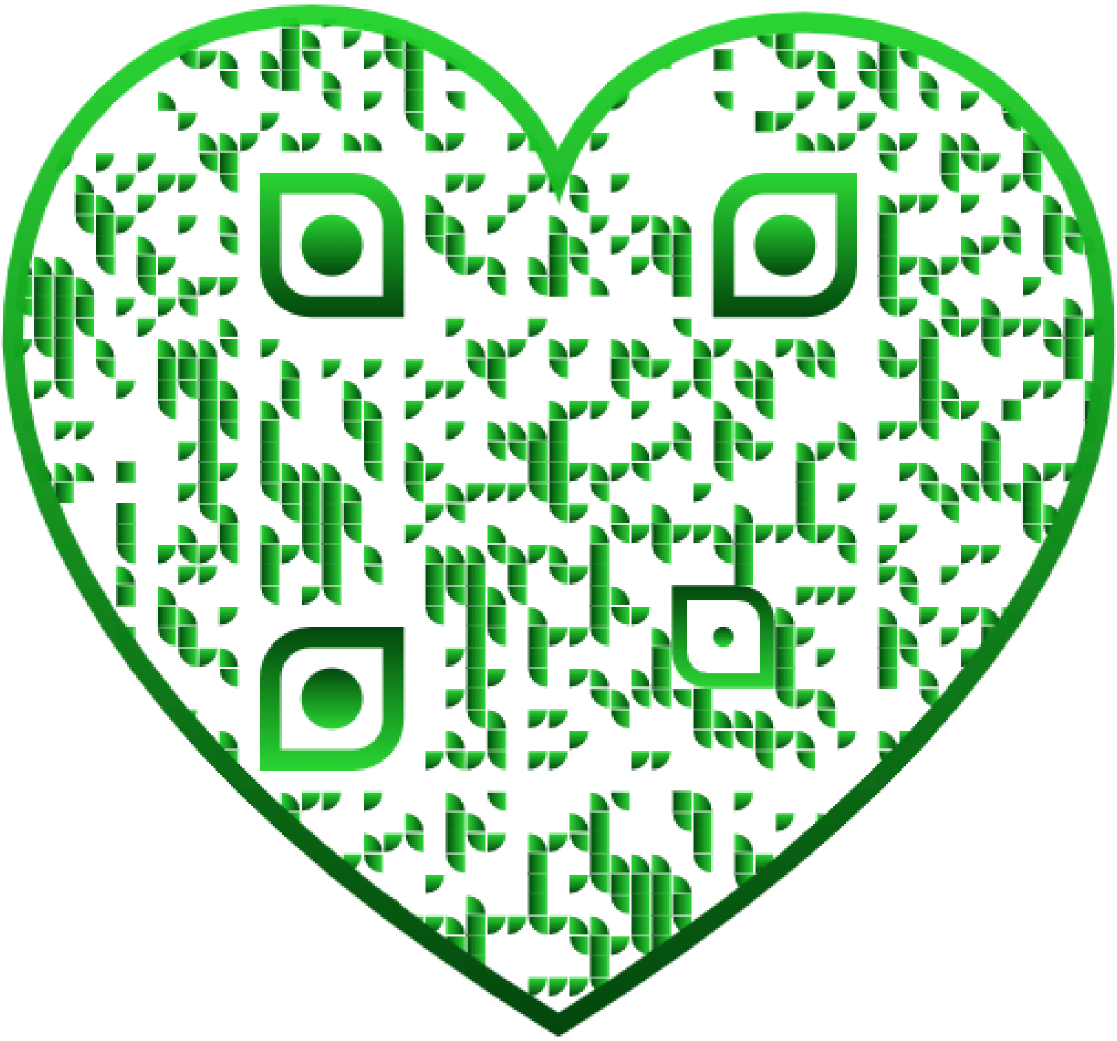
E-BOOK

Beat

MICROPHONES

NO MORE RECORDING FRUSTRATION: HOW TO FIND THE BEST SOUND



BUYER'S GUIDE

MICROPHONES

NO MORE RECORDING FRUSTRATION: HOW TO FIND THE BEST SOUND

Image: Røde / Hyperactive

The microphone is the heart of your sound - whether you‘re a beatmaker, live performer, sound engineer, podcaster, or singer. It determines the quality of the recording even before you adjust the first knob. But which type is right for you? Which polar pattern captures your sound perfectly? What are USB microphones good for, and is a vocal booth really necessary? We‘ll cover the basics, dispel common myths, and give you practical tips for vocals, instruments, and speech so you can avoid common mistakes and get the most out of your setup! Plus, we‘ve included 24 microphones in our buying guide.

by Sascha Blach, Marco Scherer, Julian Schmauch, Vera Schumacher, Christoph Strauss

Real recordings breathe life into any production – especially if your track has so far consisted solely of samples, virtual sound generators, or loops. Vocals, guitar, bass, percussion, or drums: All of these can infuse your music with a depth and energy that‘s difficult to replicate using purely digital means. But before you even click „Record,“ there‘s the all-important question: Which microphone suits your needs, sound, space, and budget? And what really matters when it comes to equipment, beyond marketing promises and specifications?

In this special, we‘ll take you by the hand and provide orientation – with a well-founded, practical overview from A to Z. You‘ll not only gain the necessary know-how to better understand technical terms like polar pattern, frequency response, and sound pressure, but also practical tips on how to use microphones effectively – whether for vocals, acoustic instruments, or amplifier miking.

In addition to a concise introduction to microphone types, parameters, and areas of application, you can expect recommendations for typical recording situations, such as recording vocals, guitar, bass, or drums. Also in focus: the most common microphone mistakes – and how to avoid them.

Modern solutions such as virtual microphone modelers, smartphone recording setups, and accessories are also covered. After all, it‘s not just the microphone that creates the sound, but the entire signal chain: microphone, preamp, audio interface – and, of course, your decision about how much coloration or neutrality you want to allow when recording. Whether you prefer clean recording or adding some character to your signal during recording – we‘ll show you how to achieve both.

The masterclass is rounded off with a market overview of 16 microphones for all budgets – from affordable all-rounders to high-end references. In short: The following pages show you what‘s important to ensure your next take is not just recorded, but heard. ::

Myth busters: 5 mic mistakes that cost unnecessary money

1 Expensive = automatically better

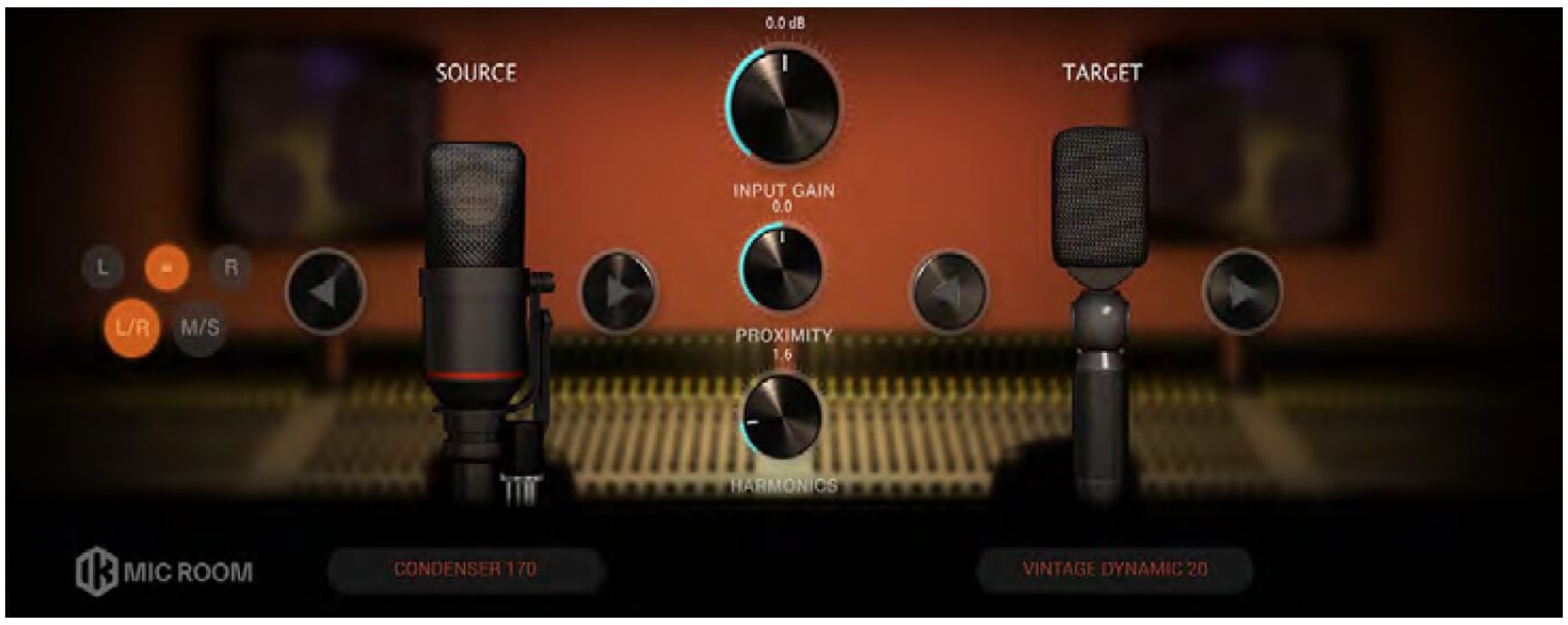
Sure: Good microphones have their price. But not every high-end model is automatically a good fit for your setup, your voice, or your room. An affordable microphone that‘s exactly right for your application can often be more beneficial than an overpriced prestige tool that doesn‘t suit you.

2 Large diaphragm is always the best choice

Large-diaphragm condenser microphones like the exquisite Telefunken U47 are considered the standard for vocals – but that doesn‘t mean they‘re ideal in every situation. Especially with loud sources or in untreated rooms, a dynamic microphone can often deliver better results. With their often very linear sound and precise transient reproduction, small-diaphragm condenser microphones have proven themselves for recording acoustic guitar, overheads, piano, strings, hi-hats, and even field recording.

3 Modeling microphones are just a gimmick

Virtual microphone systems like the Slate ML-1, IK Multimedia Mic Room, or Townsend Sphere now offer amazingly realistic emulations of classic studio microphones, including various polar patterns and timbres. They‘re an exciting alternative with many creative possibilities, especially for producers with limited space or budget.



4 USB microphones are only good for podcasts

Long outdated: Modern USB microphones like the Apogee Mic Plus deliver astonishingly good sound quality and are more than just a stopgap, especially for mobile setups or home recording. Those looking for simple, direct workflows without an external interface will find solid solutions here, even for music productions.

A good choice for mobile recording: The Apogee MiC Plus USB microphone, with studio sound and a built-in compressor.

5 Cardioid polar pattern is always the best choice

Although the cardioid pattern is a proven all-rounder, it isn‘t ideal in every scenario. For stereo recordings, interviews, or surround sound, an omnidirectional, figure-8, or supercardioid pattern can deliver significantly better results. A quick look at the data sheet and a little experimentation are worthwhile.

Verdict

Instead of being guided by myths or marketing slogans, it‘s worth testing microphones with an open mind – and paying attention not only to the price, but also to how they interact with your voice, your room, and your workflow. ::

Image: Heil Sound, Band: Red Fang

Basics

I. Microphone types and how they work

There are different types of microphones, each of which is suitable for different purposes. An overview.

Dynamic microphones

Dynamic or moving-coil microphones are robust and suitable for loud sound sources. They are very popular on live stages, as they are (usually) not harmed if they take a knock. They work with a moving coil that moves in a magnetic field when sound hits a diaphragm. This movement induces an electrical voltage in the coil. They don't require phantom power and are often used in the studio with guitar amplifiers and drums (snare drum, kick drum, toms) because they are insensitive to loud signals. The sound is usually less refined, as bass and treble are less well reproduced than with condenser microphones, but they are valued for their reliability.

Good to know: Dynamic microphones often have a strong proximity effect, which amplifies the bass at close range – this can add richness to the sound. Therefore, always position dynamic microphones close to the sound source.

Practical tip: Singers who move around a lot in the studio can use a dynamic microphone. It is important to consider whether a slight loss of sound quality can be compensated for by a better performance from the vocalist. Typical examples would be rappers or screaming metal singers, who also produce high sound pressure levels with their voices, as these microphones are less likely to clip.

Condenser microphones (large/small diaphragm)

Condenser microphones deliver a more detailed, realistic sound than dynamic microphones. They use an electrically charged diaphragm and require phantom power (e.g., 48V) and are ideal for vocal and speech recordings. Small-diaphragm condensers are particularly precise and well-suited for acoustic instruments such as acoustic guitars or room recordings, and are used for drum recordings (hi-hats, rides, and overheads). Condenser microphones are sensitive to ambient noise and vibration, as well as sudden impulses and clipping - especially without a pad switch. This also affects popping sounds, which is why a pop filter is recommended for vocal recordings.

Good to know: Large-diaphragm microphones have a long lifespan. You don't just buy them, you marry them. However, they do require proper care. Therefore: don't drop them, don't smoke in the studio, use a pop shield to protect against moisture (spit), and always protect them from dust to prevent the diaphragm from becoming sluggish. And put them back in their case when not in use.

Practical tip: Condenser microphones are sometimes so accurate that they can even „listen in" to neighboring apartments – especially omnidirectional microphones. This is both a blessing and a curse when recording vocals, as they pick up every little background noise or smacking sound, but guarantee a very clear sound. It is a good idea to process such high-resolution vocal recordings that contain noise with the iZotope RX tools (especially De-Crackle) or similar repair plug-ins.

Two of the most popular small diaphragm condenser microphones: Røde NT5 and Neumann KM 184

Ribbon microphones

Technically speaking, ribbon microphones are classified as dynamic microphones, but differ significantly in design and sound characteristics. They feature a thin metal ribbon suspended between magnets that vibrates when exposed to sound. They respond particularly smoothly and musically to sound, with a natural, darker tone - and are similarly true to the original as condenser microphones. They, too, must be handled with care, especially with regard to wind (don't blow on them!) and improper phantom power. They are often heavier and larger than other microphone types and therefore somewhat unwieldy. However, modern models usually weigh less than a kilogram. Once often used in broadcasting, they are now popular again for vocals, wind instruments, or guitars.

Good to know: Ribbon microphones often have a figure-8 polar pattern and are ideal for recording two singers facing each other.

Practical tip: Due to their low output level, a ribbon microphone requires significant amplification (at least 80 dB). Therefore, they particularly benefit from a high-quality preamp. In the past, recordings often had a lot of noise, but today, thanks to better preamps, this is usually no longer a problem.

In addition to these well-known microphone types, there are also some specialized microphones, usually designed for specific applications:

USB microphones

Models like the Blue Yeti or RØDE NT-USB can be connected directly to the computer via USB – this is ideal for podcasts, streaming, or quick recordings, as it's straightforward and eliminates the need for a preamp (since the preamp and converter are already integrated). Combined with digital emulation of classic microphones or preamps, this is certainly a promising option for the future.

Boundary microphones

With these flat microphones (e.g., Shure MX391), the housing shape determines the acoustic properties. They have a semi-spherical polar pattern. They are placed on a surface such as the floor or a wall. They use the boundary surface to amplify and reproduce sound with phase accuracy and are also popular in bass drums, e.g., the Shure Beta 91A.

Lavalier microphones

Classic clip-on microphones like the AKG C 417 PP are small and worn on the body. Perfect for interviews or film recordings.

Shotgun microphones

Models like the Sennheiser MKE 600 are highly directional and precise, capturing almost exclusively the sound directly in front of them. They are often used in film and TV production, sports broadcasts, news reporting, and field recording.

II. Microphone parameter & specifications

When comparing microphones, technical specifications help you better assess sound, application, and quality. Here are some of the most important parameters explained in a clear manner.

Frequency response

The frequency response indicates which frequencies a microphone picks up and to what extent – typically expressed in Hertz (Hz). A linear frequency response means that all frequencies are transmitted evenly, although 100% linearity is never possible. Some microphones specifically emphasize high frequencies (e.g., for greater speech intelligibility) or low frequencies (for more warmth). A typical range is 20 Hz to 20 kHz, which corresponds to the theoretical human hearing range (high frequencies decrease with age). A balanced frequency response is particularly important for vocals, speech, or acoustic instruments.

Practical tip: For certain applications, such as snares, bass drums, or amps, you want microphones with a specific frequency coloration. This is referred to as „character." A good example of this is the SM57, which has a specific, characteristic treble emphasis that has proven effective with snares or guitar amps. The U87 from Neumann, on the other hand, is so popular for vocals because its frequency response is tailored to the voice.

Sensitivity

Simply put, there are loud and quiet microphones. The sensitivity value indicates how much electrical signal a microphone generates from a given sound pressure level. In German, it's often referred to as the „transmission factor" (transmission factor), as this term is more precise. This value is usually expressed in mV/Pa or dBV/Pa. Typical values for dynamic microphones are between 1 and 4 mV/Pa, or -60 to -48 dB, while condenser microphones are between 8 and 32 mV/Pa, or -42 to -30 dB. Condenser microphones are therefore more sensitive than dynamic ones – they deliver a stronger signal for the same sound level and require less pre-amplification. This is advantageous for quiet sound sources or when the microphones are at greater distances. And don't be confused: a microphone with a sensitivity of -40 dB is „louder" than one with -50 dB!

Practical tip: With very loud sources (e.g. kick drum), a sensitive mic can easily distort – that's when a pad switch comes in handy.

Flexible when recording bass drums: with the Lewitt DTP 640 REX with pad switch

Sound Pressure Limit

The Sound Pressure Level (SPL) is the maximum sound pressure level a microphone can handle without distortion. This is the sound pressure level that results in a certain level of distortion – typically, a distortion level of 0.5% at 1 kHz is permitted. This value is usually given in dB SPL. The maximum sound pressure level for condenser microphones is typically 120 to 130 dB (even higher for newer microphones), and for dynamic microphones, it is around 140 to 150 dB. If the maximum sound pressure level is exceeded, the internal microphone amplifier or impedance converter is overwhelmed – dynamic microphones are more robust in this regard. A value of 140 dB SPL, for example, means that the microphone can easily record even loud sound sources such as snare drums or brass instruments.

Practical tip: If you're recording metal vocals, drums, or brass instruments, for example, you should pay attention to a high SPL rating (at least 135 dB). However, with dynamic microphones, you generally don't have to worry about distortion, which is why this value isn't always specified.

Self-noise

This term, sometimes called equivalent noise level for condenser microphones, describes the background noise of the microphone itself, even when no sound is present. It is measured in dB(A). Anything up to 10 dB(A) is considered extremely low self-noise, and above about 20 dB(A), the perception threshold is exceeded – the lower the value, the better. High-quality condenser microphones often have values below 15 dB(A), while inexpensive models sometimes exceed 20 dB(A). For dynamic microphones, this value is often not specified. In these cases, self-noise is not a property of the microphone itself, but rather strongly depends on the preamp. Values around 18 dB(A) are common.

Practical tip: Microphones with low self-noise are ideal for quiet acoustic recordings or voice recordings in the studio – as well as when a greater distance from the sound source is desired.

Impedance

Impedance describes the electrical resistance of a microphone to alternating current, typically measured in ohms (Ω). A microphone should have an impedance of less than 200 ohms to work well with modern preamplifiers. The input impedance of the subsequent microphone preamplifier should be at least three times the microphone's impedance. High impedances can lead to level loss or sound distortion, especially over long cable runs.

Practical tip: In practice, impedance is usually not a problem as long as the microphone and preamp are compatible. Only with vintage equipment or passive ribbon microphones should you take a closer look.

Total Harmonic Distortion – THD

Total Harmonic Distortion (THD) was already mentioned in the section on maximum sound pressure. It indicates the degree of additional harmonics (distortion) a microphone generates when processing a signal. This refers to unwanted signal impurities, not desired harmonics. This value is expressed as a percentage – good microphones have values below 0.1%. A high THD can audibly distort the sound of loud signals. However, in the bass range – i.e., below 150 Hz – a THD of 5% is usually not even noticeable, while above 1000 Hz, a THD of 0.5% can be clearly audible.

Practical tip: Low distortion is standard in professional applications – it's especially important for high-quality vocal or instrument recordings.

III. Understanding and applying directional patterns

Microphones do not record equally in all directions. The so-called directivity pattern describes the directions from which a microphone captures sound well or less well. This has a major impact on sound, feedback, and the amount of room ambience. Here is an overview with practical application tips.

Omnidirectional

Omnidirectional microphones capture sound evenly from all directions. They produce a particularly natural sound because they do not produce any coloration due to direction-dependent recording behavior, and therefore have no proximity effect. The disadvantage: They also capture a lot of ambient sound and background noise. They are ideal for room recordings, for atmospheric recordings, or for speakers who are moving freely. This pattern is also used in measurement microphones.

Practical tip: In music, omnidirectional microphones should only be used if you deliberately want to capture the entire room. An example would be a particularly good-sounding studio for drum recordings or a realistic orchestra or choir recording, where you could place the omnidirectional microphone in the middle of the ensemble. Otherwise, directional microphones are the more sensible choice in music in most cases because they capture more precisely and suppress ambient sound more effectively.

Cardioid

The cardioid polar pattern is the standard for many microphones. It captures sound from the front well, slightly less from the sides, and hardly at all from the rear. This allows for effective rejection of distracting ambient or stage sound, making it ideal for vocals, speech, or close-up miking of amps, brass, snare drums, or toms. It also reduces feedback in live applications. The cardioid is a good compromise between directness and naturalness.

Practical tip: While cardioids almost always work, you should consider using supercardioid or hypercardioid microphones for drum recordings, where bleed can be a major problem, to further reduce it.

Supercardioid and hypercardioid

These polar patterns are a narrower version of the cardioid, visually they have a lobe shape. They pick up sound very precisely from the front, but often have a slight additional sensitivity to the rear. This makes them even better suited for blocking out distracting background noise or ambient noise from the sides. They are particularly well-suited for noisy environments – such as on stages, in churches, during interviews, or for the targeted miking of loud instruments. However, if positioned incorrectly, they can quickly sound unnatural.
Examples: Shure Beta 58 A (supercardioid), Audio-Technica AT4053b (hypercardioid)

Practical tip: These directional designs are particularly effective on stage for preventing feedback and crosstalk from other musicians. However, you shouldn't point the back of the monitor directly at the monitor. Therefore, rotate the monitor slightly sideways (approximately 110 degrees).

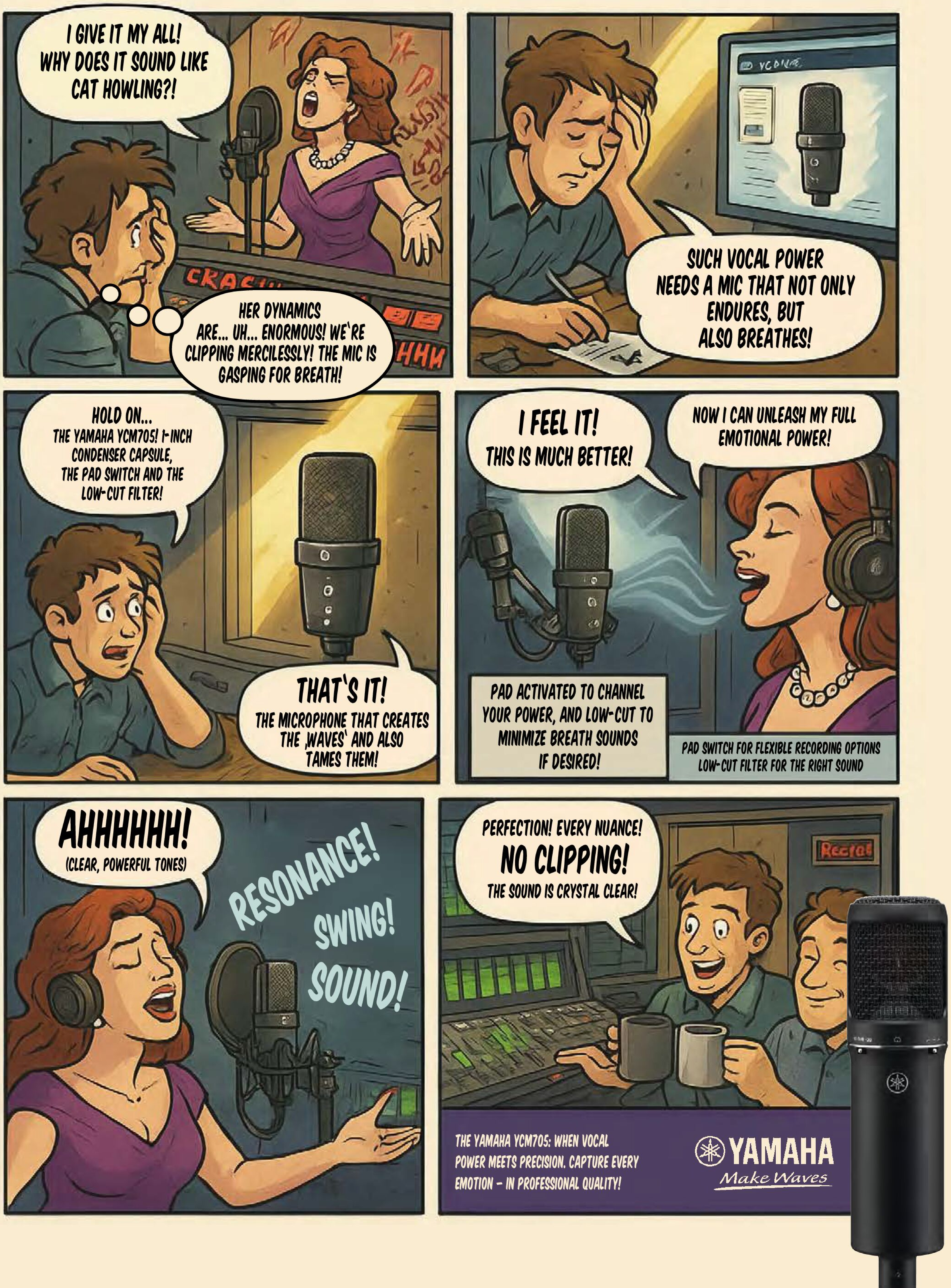
Figure-8 (bidirectional)

Figure-8 microphones pick up sound equally from the front and back, but hardly any from the sides. This makes them ideal for face-to-face recordings (e.g., two singers on one microphone) or stereo techniques. Figure-8 microphones are sensitive to ambient sound if the room is not controlled. This characteristic is often found in ribbon microphones and has the strongest proximity effect. In some microphones, it can also be switched on, which increases flexibility.

Practical tip: Figure-8s can be used to specifically mask out heavily breathing musicians, e.g., on violin, cello, or acoustic guitar. They are also a good choice for drum overheads for a clear sound image. The back of the microphone should not be too close to highly reflective ceiling surfaces. They are also a good choice as ambient microphones for drums.

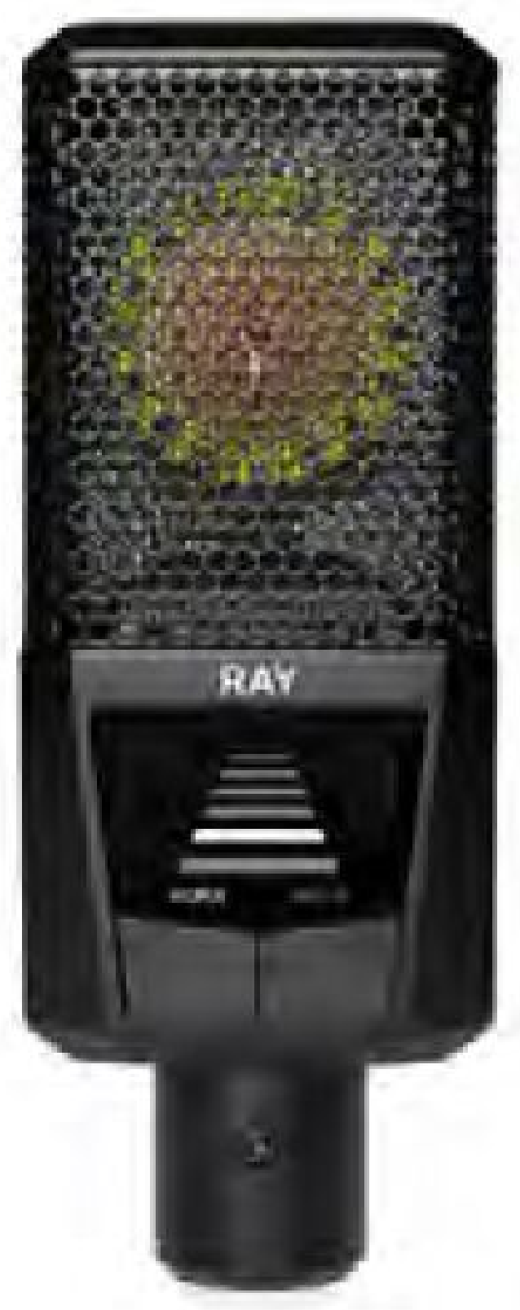
Bonus tip: Microphones with switchable polar patterns or interchangeable capsules offer particular flexibility. ∷

THE VOCAL VIRTUOSO AND THE YCM705


I GIVE IT MY ALL! WHY DOES IT SOUND LIKE CAT HOWLING?!
HER DYNAMICS ARE... UH... ENORMOUS! WE'RE CLIPPING MERCILESSLY! THE MIC IS GASPING FOR BREATH!
SUCH VOCAL POWER NEEDS A MIC THAT NOT ONLY ENDURES, BUT ALSO BREATHES!
HOLD ON... THE YAMAHA YCM705! 1-INCH CONDENSER CAPSULE, THE PAD SWITCH AND THE LOW-CUT FILTER!
THAT'S IT! THE MICROPHONE THAT CREATES THE ‚WAVES' AND ALSO TAMES THEM!
I FEEL IT! THIS IS MUCH BETTER!
NOW I CAN UNLEASH MY FULL EMOTIONAL POWER!
PAD ACTIVATED TO CHANNEL YOUR POWER, AND LOW-CUT TO MINIMIZE BREATH SOUNDS IF DESIRED!
PAD SWITCH FOR FLEXIBLE RECORDING OPTIONS LOW-CUT FILTER FOR THE RIGHT SOUND
AHHHHHH! (CLEAR, POWERFUL TONES)
RESONANCE!
SWING!
SOUND!
PERFECTION! EVERY NUANCE! NO CLIPPING! THE SOUND IS CRYSTAL CLEAR!
THE YAMAHA YCM705: WHEN VOCAL POWER MEETS PRECISION. CAPTURE EVERY EMOTION – IN PROFESSIONAL QUALITY!
YAMAHA
Make Waves

Buyer's guide: 16 popular microphones at a glance

	 Shure **SM58 LC**	 **Audio-Technica** **AT 2020 USB-X**	 **Sennheiser** **E 906**	 **Austrian Audio** **MiCreator Studio**
Converter principle	Dynamic	USB condenser microphone	Dynamic	USB condenser microphone
Polar pattern	Cardioid	Cardioid	Supercardioid	Cardioid
Phantom power	No	No, because USB	No	No, because USB
Transmission range	50 - 15.000 Hz	20Hz – 20kHz	40 - 18.000 Hz	20 - 20.000 Hz
Sensitivity	-56 dBV/Pa (1,85 mV)	n/a	n/a	-35 dBFS/Pa
Maximum sound pressure	n/a	n/a	n/a	130 dB SPL
Signal-to-noise ratio	n/a	n/a	n/a	n/a
Dynamic range	n/a	n/a	n/a	n/a
High-pass filter	non-existent	non-existent	non-existent	non-existent
Pad (dB)	non-existent	non-existent	non-existent	non-existent
Particularly suitable for ...	Live vocals	Vocals, streaming, podcasting	E-guitar, snare drum, brass	Speech, Live streams, instruments
Special feature	integrated filter that reduces breathing and wind noise	Internal headphone amplifier with connection	Three selectable sound characteristics	integrated audio interface, input for connecting a second device
Scope of delivery	Microphone clamp	Tripod, USB cable, USB adapter	Microphone clamp	USB and instrument cables, adapters
Weight	298 gram	373 gram	140 gram	370 gram
Verdict	The Shure SM58 LC is a global classic for vocals and speech on stage. With its robust construction, clear midrange, and effective feedback suppression, it reliably delivers the best sound – even under the toughest conditions. The cardioid polar pattern minimizes background noise, and the integrated pop filter ensures clean recordings. In addition to stage use, the microphone is also suitable for streaming.	The AT2020USB-X combines the clear, natural sound of the classic studio-grade AT2020 with modern USB-C technology. Ideal for podcasts, as well as content creators for streaming and music recording, it offers a resolution of 24-bit/96kHz. A sturdy tabletop stand and simple plug-and-play operation are included. This delivers professional results without much effort—perfect for creatives in their home studio.	The e 906 is a dynamic microphone with a supercardioid polar pattern, ideal for guitar amps, snares, and brass instruments. Its flat design allows for direct placement on the cabinet - even without a stand. The three-position presence switch allows for flexible sound adjustment from brilliant to soft. Perfect for loud stages: clear focus on the source, minimal crosstalk.	The MiCreator Studio combines a high-quality USB condenser microphone with an integrated audio interface. Plug-and-play via USB-C, a robust metal housing, and clear sound: Whether at home or on the go, this compact setup delivers reliable results every time. A powerful solution for content creation, music, or speech. Includes free Steinberg software: Cubase LE as a full-featured DAW and WaveLab Cast as an audio editor.
Price	**109 Euro** https://tinyurl.com/7s3afn42	**127 Euro** https://tinyurl.com/4tuxtmuw	**149 Euro** https://tinyurl.com/3fxn9m6f	**160 Euro** https://tinyurl.com/36n66xpm

	 Røde NT1 **5th Generation**	 **Apogee** **MiC+**	 **Universal Audio** **SD-1**	 **Lewitt** **RAY**
Converter principle	Large-diaphragm condenser microphone	USB condenser microphone	Dynamic	Large-diaphragm condenser microphone
Polar pattern	Cardioid	Cardioid	Cardioid	Cardioid
Phantom power	yes	No because USB	No	Yes
Transmission range	20 - 20.000 Hz	n/a	15 – 16.000 Hz	20 - 20.000 Hz
Sensitivity	-32 dB re 1 Volt/Pascal (25 mV @ 94 dB SPL	-36 dBfs (94 dB SPL. 1 kHz)	-58 dB (1.3 mV)	-32,9 dBV/Pa
Maximum sound pressure	142 dB SPL	130 dB	n/a	131 dB SPL
Signal-to-noise ratio	n/a	-108dBfs (A)	n/a	n/a
Dynamic range	n/a	n/a	n/a	n/a
High-pass filter	yes	non-existent	yes	non-existent
Pad (dB)	non-existent	non-existent	non-existent	non-existent
Particularly suitable for …	Vocals, speech, guitar, piano, drums	acoustic instruments, vocals	Speech, vocals, instruments	Language, live streams, podcasts
Special feature	Dual-connect port (XLR and USB-C)	Sound quality with up to 24 bit/96 kHz thanks to PureDIGITAL	Hemisphere Mic Modeling	automated muting and leveling and autofocus of the voice
Scope of delivery	Microphone holder with pop filter, USB cable	Tripod, USB-CC cable	Microphone clamp and pop filter	Microphone shock mount, pop filter, windscreen, leather case
Weight	311 gram	200 gram	735 gram	330 gram
Verdict	The 5th generation NT1 combines the warm sound of its predecessors with modern technology. Thanks to Dual Connect, it can be used via XLR or USB – including 32-bit float recording without clipping. Its extremely low self-noise and high level handling make it ideal for everything from vocals and speech to guitar, piano, drums, and percussion. A flexible studio tool with contemporary features.	The Apogee MiC+ offers high-quality, studio-quality 24-bit/96kHz recording resolution. Thanks to the PureDIGITAL connection, it delivers detailed, noise-free recordings. The sensitive capsule ensures pristine sound and is ideal for vocals and acoustic instruments. Plug and play—simply connect and start recording, without any additional equipment. Perfect for professional-quality mobile recording.	The SD-1 from Universal Audio is a dynamic microphone with integrated hemisphere modeling technology that recreates the sound of legendary studio classics. Thanks to a low-cut filter and presence boost, the sound can be flexibly shaped. Ideal for vocals, speech, and instruments, it achieves clear, professional recordings even in acoustically challenging spaces. The integrated mic models include the DN-7, DN-20, RB-77DX Satin, DN-88, and DN-441.	The Lewitt RAY is an innovative condenser microphone with AURA technology that automatically adjusts level and tone as you move. Ideal for dynamic performances or untrained speakers. The mute-by-distance function stops recording when you move away and automatically reactivates it when you return. Thanks to „Record-Ready Sound,“ recordings sound convincing right away – without any post-production.
Price	**218 Euro** https://tinyurl.com/ykt9x9at	**279 Euro** https://tinyurl.com/4dxkxaxv	**269 Euro** https://tinyurl.com/3yfr9jfm	**329 Euro** https://tinyurl.com/3fjc7eps

	Sennheiser **MD421-II**	**Shure** **SM7B**	**Audio-Technica** **AT4040**	**Slate** **Digital ML-1A**
Converter principle	Dynamic	Dynamic	Large-diaphragm condenser microphone	Large-diaphragm condenser microphone
Polar pattern	Cardioid	Cardioid	Cardioid	Cardioid ML-1
Phantom power	No	No	Yes	Yes
Transmission range	30 - 17.000 Hz	50 - 20.000 Hz	20 - 20.000 Hz	20 bis 20.000 Hz
Sensitivity	n/a	-59,0 dB	-32 dB (25,1 mV)	-32.5 dB
Maximum sound pressure	n/a	n/a	145 dB SPL	145 dB SPL (at -20 dB Pad)
Signal-to-noise ratio	n/a	n/a	n/a	86 dB.
Dynamic range	n/a	n/a	133 dB	n/a
High-pass filter	non-existent	Yes	non-existent	non-existent
Pad (dB)	non-existent	non-existent	Yes (10 dB)	existing (0, -10 and -20 dB)
Particularly suitable for ...	Speech, guitar, brass, drums	Speech and vocals, kick, guitar and bass amplifiers	Vocals, acoustic instruments	Drum overheads, vocals, bass amps
Special feature	5-stage bass switch	Bass roll-off switch	soft, natural sound	Mic model morphing between two models
Scope of delivery	Microphone clip	Wind protection	Microphone shock mount	Spider, carrying bag
Weight	385 gram	766 gram	360 gram	450 gram
Verdict	The MD421-II is a dynamic classic with a distinctive sound character and high versatility. Thanks to its cardioid polar pattern and 5-position bass switch, it‘s ideal for toms, guitar amps, brass, percussion, and vocals. The prominent midrange provides punch in the mix, while the low-feedback mic is impressive in the studio and live. A robust workhorse with character and a flat frequency response down to approximately 1.5 kHz.	The Shure SM7dB combines the iconic sound of the SM7B with an integrated preamp for up to +28dB of gain. This delivers a powerful, low-noise, transparent signal with a flat frequency response, even on low-power interfaces - without the need for an external preamp. Ideal for podcasts, voice and vocal recordings, and streaming, with direct, natural sound and reduced setup effort.	The AT4040 impresses with its smooth, natural sound and high level handling. Its transformer-free circuitry ensures distortion-free, detailed recordings with a wide dynamic range. Its preferred applications are vocals and instruments. Other advantages include its low self-noise levels, fast response, and excellent noise isolation - a versatile all-rounder for professional studio applications.	The ML-1A is a modeling microphone with very low self-noise and high level handling. Combined with the VMS plug-in, it provides access to numerous classic microphone and preamp models – even editable after recording. Timbre and proximity effect can be flexibly adjusted. Selectable virtual preamps let you add saturation and depth, all with real-time control from tracking to mixdown.
Price	**379 Euro** https://tinyurl.com/bdjv88ht	**545 Euro** https://tinyurl.com/mrd2xe5f	**449 Euro** https://tinyurl.com/2chcn2up	**649 Euro** https://tinyurl.com/ycpr87z8

	 Lewitt **PURE TUBE**	 **AKG** **C414 XLII**	 **Sontronics** **Saturn 2**	 **Neumann** **U87 Ai**
Converter principle	Large diaphragm tube microphone	Large diaphragm condenser microphone	Large diaphragm condenser microphone	Large diaphragm condenser microphone
Polar pattern	Cardioid	including cardioid, hypercardioid, omnidirectional, figure-8	including omnidirectional, wide cardioid, cardioid, hypercardioid and figure-8	Omnidirectional, Cardioid, Figure-8
Phantom power	Yes	Yes	Yes	Yes
Transmission range	20 - 20.000 Hz	20 - 20.000 Hz	20 - 20.000 Hz	20 – 20.000 Hz
Sensitivity	-31 dBV/Pa	23 mV/Pa	n/a	n/a
Maximum sound pressure	132 dBSPL	140 dB SPL	130 dB SPL	127 dB
Signal-to-noise ratio	87 dB (A)	88 dB	n/a	n/a
Dynamic range	125 dB (A)	152 dB	n/a	n/a
High-pass filter	non-existent	Yes	Yes	Yes
Pad (dB)	non-existent	Yes	Yes	Yes
Particularly suitable for ...	Speech and vocals	Vocals and instruments	Vocals, choir, guitars, strings, woodwinds, room ambience	Speech and vocals
Special feature	hand-selected tube	9 switchable characteristics, 3 bass filters	Damper and ring design, 9 characteristics	Very low inherent noise
Scope of delivery	Microphone holder	Spider, windscreen, pop filter	spider, suitcase	wooden case
Weight	692 gram	300 gram	540 gram	500 gram
Verdict	The PURE TUBE is a distinctive tube microphone with a refined sound for modern vocal productions. It completely eliminates semiconductors in the signal path and delivers rich overtones and depth thanks to minimal self-noise. An integrated filter musically compensates for the proximity effect. All in all, a high-quality microphone with natural, studio-quality warmth.	This AKG C414 XLII is a true phenomenon, as it simply brings great sound to any sound source. Whether vocals, kick drums, toms, snare drums, guitar amps, or electric bass – the 414 works for everything. Nine polar patterns, from omnidirectional to figure-8, a switchable high-pass filter from 40-160 Hz, and a 6-16 dB pre-attenuation round out the package. Anyone looking for an excellent, universal large-diaphragm condenser microphone should take a closer look at the C414 XL II.	The Saturn 2 is a highly sensitive, large-diaphragm condenser microphone with nine switchable polar patterns, conveniently selected via a digital encoder. It delivers a detailed, clear sound and is ideal for classical instruments and vocals. Designed and handcrafted in Great Britain, it combines modern design with absolute fidelity - perfect for the finest studio recordings.	The U 87 Ai is the ultimate studio microphone – known for its balanced, distinctive sound and versatility. With three polar patterns, bass roll-off, and pre-attenuation, it‘s equally suitable for vocals, speech, and instruments. Its combination of technical precision and musical charisma makes it the worldwide studio standard and the reference for professional recordings.
Price	**949 Euro** https://tinyurl.com/mr4tn5tu	**959 Euro** https://tinyurl.com/tt8v4s8t	**1.539 Euro** https://tinyurl.com/3cbzr565	**2.899 Euro** https://tinyurl.com/cuj4skj4

For guitars, drums, vocals and more

A legend for all occasions

Anyone who works in the studio or on stage knows the problem: you need a different microphone for every setup - or you‘re lucky and one simply works everywhere. The Sennheiser MD 421 Compact is just such a microphone. A real all-rounder for speech, instruments and drums that works in any situation, with a powerful sound, robust construction and a format that fits into any setup.

Guitar amp? Just do it.

If you‘ve ever recorded guitars, you know: volume isn‘t the friend of every capsule. This calls for microphones that can handle high sound pressure levels cleanly. Many people turn to dynamic models with a cardioid polar pattern – especially the Sennheiser MD 421, a classic that has been used in studios and on stage for decades. The new compact version now brings this proven sound into a smaller housing, ideal for setups with limited space. The sound remains as direct and powerful as ever, especially when combined with tube amps and distorted guitars.

Micing drums? Easy.

Whether toms, snare, or percussion – the handy design of the MD 421 Kompakt makes it ideal for placement between cymbals and other hardware. The sound remains precise and powerful, even during heavy playing. If you want to use the microphone on a drum set, the drum version with the MZH drum clamp is ideal, ensuring a stable hold directly on the rim of the toms or snare.

Wind instruments? Of course!

Wind instruments aren‘t always easy to mike. Too close, they quickly sound unpleasant, and too far away, they lack presence. The MD 421 Kompakt excels here with its high directivity and natural-sounding frequency response. Trumpets, trombones, and saxophones benefit from the controlled proximity effect, which adds additional warmth to the signal. At the same time, the treble response remains open enough to accurately capture even the finest articulations.

Speech & vocals? Of course!

The MD 421 Kompakt is also an interesting option for voice recordings, especially in noisy environments, such as interviews or on stage. The cardioid polar pattern ensures clean separation from the ambient sound. Whether podcasts, voice-overs, or live speech: the MD 421 Kompakt impresses with clarity and presence without unnecessary harshness. It delivers a full, pleasant sound, especially with lower voices. Unlike many condenser microphones, this model is less sensitive to plosives or restless speaker movements. This makes it a robust microphone for mobile recording situations, live recordings, or presentations.

Reliable in the studio & live

Are you looking for a microphone that performs reliably both in the club and in the studio? The MD 421 Kompakt is your reliable companion – robust enough for everyday stage use, sensitive enough for precise recording. A stainless steel microphone, gold-plated XLR contacts, and an internal protective housing against dust and moisture make it a reliable partner, even in changing temperatures, fast setups, and long sessions.

Verdict: A microphone for all occasions

The Sennheiser MD 421 Kompakt is the right choice for anyone looking for a versatile, robust, and sonically convincing microphone for studio and stage – without technical overkill and at a fair price. Whether guitar, drums, vocals, or wind instruments: This compact workhorse delivers reliable results with character in every situation. It doesn‘t replace every specialized microphone, but it does a really good job in a surprisingly wide range of applications. Anyone who wants to spend less time tinkering and more time recording will find a trusty companion here that brings the focus back to what‘s important: the sound. ⁘

Compact yet powerful – the highlights at a glance:

- **Legendary sound:** Large-diaphragm capsule with clear highs and rich mids
- **Space-saving:** Ideal for tight setups on drums, amps, or in broadcast applications
- **Level-stable:** Remains clear and distortion-free even at high volumes
- **Stable mounting:** New mounting clip – no wobbling, no slipping
- **Roadworthy:** Robust construction with stainless steel contacts, gold-plated XLR contacts and internal protective housing against dust and moisture
- **Wide frequency response:** 30 Hz – 17 kHz for powerful, transparent sound
- **Made in Germany:** Developed with 80 years of audio expertise

www.sennheiser.com | 279 Euro

TF17 FET

Getting started with the Telefunken sound

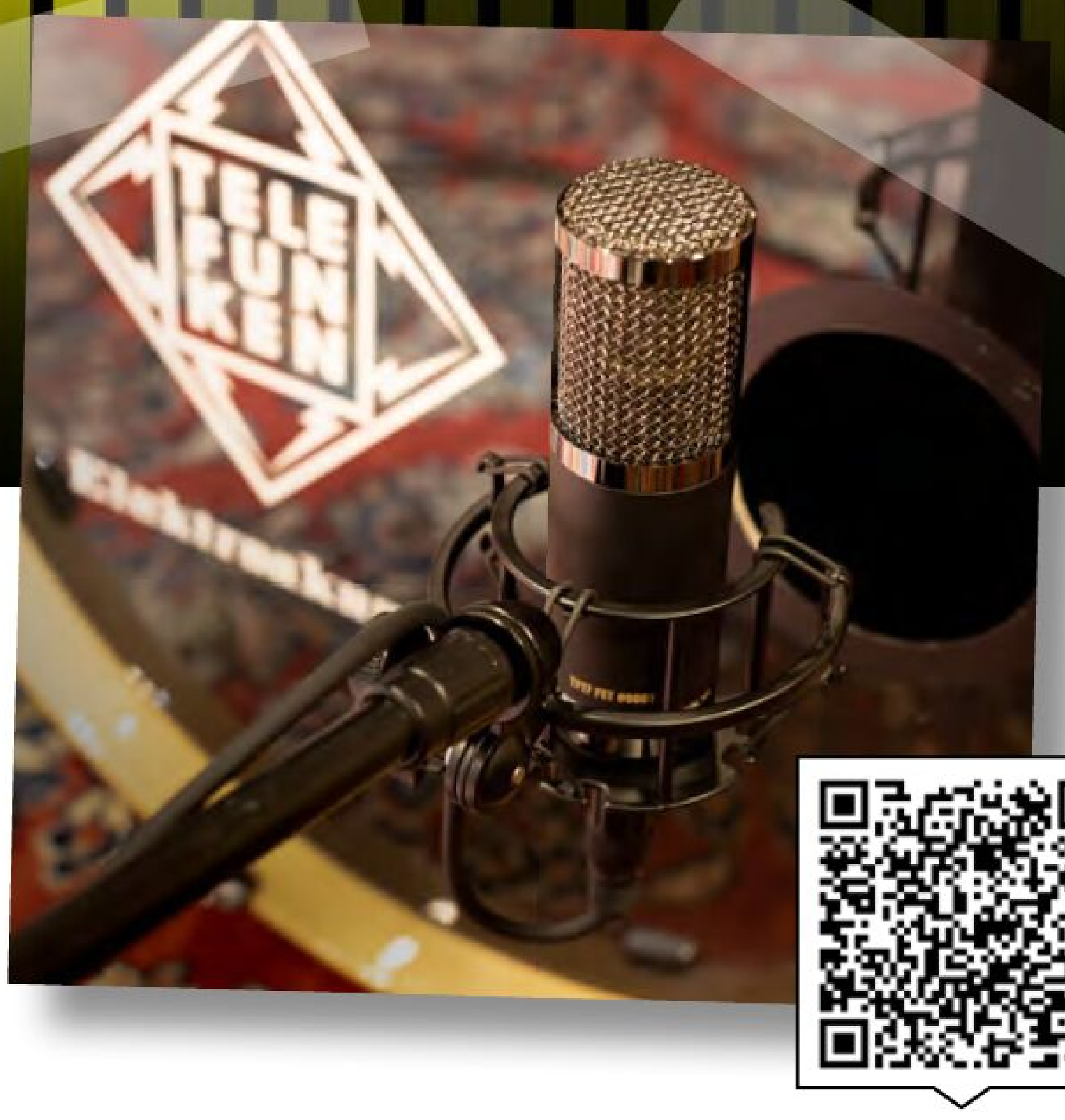
What characterizes a good vocal microphone? Many people focus on clarity and neutrality and wonder why vocals often sound too tame or harsh in the mix. But an excellent vocal microphone needs more than just a flat frequency response; it needs personality. This is precisely where the TF17 FET comes in – a microphone that captures the attention without over-emphasizing.

At its heart is the K47 capsule, inspired by the legendary U47. It delivers mid-range presence, silky highs, and a powerful bass foundation—exactly the mix that lends depth and character to vocals. Not just in the studio, but also on stage, and without the need for a power supply or hassle. Simply connect via 48V and you‘re ready to go.

Even without a tube, the spirit is there: The TF17 FET relies on a low-noise FET circuit with fast transient response and a wide dynamic range. A select JFET amplifier ensures transparency, while the Carnhill output transformer adds warmth. With over 135 dB SPL and only 3 dBA of self-noise, the microphone remains confident even with loud or quiet sources. All critical components are assembled and individually tested in the USA, and each amplifier is hand-tuned before shipping. Whether you‘re recording vocals for rap, soul, rock, or R&B, the TF17 FET delivers a refined and warm sound with silky highs and a powerful bass foundation. Presence-oriented vocals, in particular, benefit from its ability to smooth out harshness. The model also excels when miking guitar or bass amps, piano, brass instruments, or toms.

Verdict

The TF17 FET brings character and quality to a format that fits any setup – and a budget that opens up the Telefunken world to even ambitious home studios. A true all-rounder with attitude. ⁘



This is what the TF17 FET sounds like

Advantages at a glance:

- ▲ Sound character inspired by legendary U47
- ▲ Cardioid polar pattern ensures precise focus
- ▲ High sound pressure level
- ▲ Frequency response from 20 Hz to 20 kHz
- ▲ Compact, robust, suitable for stage use
- ▲ Handcrafted and tuned by hand
- ▲ Most affordable entry into the Telefunken class
- ▲ RRP: 1.099 Euro

www.telefunken-elektroakustik.com
www.klemm-music.de

AEA R88

The secret weapon for natural stereo sound

The AEA R88 is the most versatile microphone in any microphone collection – and has long been more than just an insider tip for many sound engineers. Anyone who has ever experienced how it captures a guitar, a drum kit, or an entire ensemble knows: This is no ordinary stereo microphone, but a tool for sound aesthetes, with character, depth, and a true sense of space.

The R88 features two ribbon elements, positioned at a 90-degree angle to each other, phase-correctly. The double figure-8 polar pattern allows for precise stereo imaging using the Blumlein method.

The result: realistic recordings with spatial depth, perfect width gradation, and a silky ribbon character. It captures what‘s there. That‘s precisely why more and more producers who know what really matters are using it.

Verdict

Whether you‘re a studio professional or a home studio producer: If you‘re looking for a single microphone that captures character, space, and authenticity, the AEA R88 is a must. For many rock and metal producers, it‘s long been more than just a microphone – it‘s their signature tool.

R88? Whether electric guitar, vocals, or acoustic guitar: This is THE weapon. «

Henning Pauly (EytschPi42)
Music producer, composer, YouTuber

Henning Pauly is known from YouTube and his excellent productions. For him, the R88 has long been his go-to microphone for organic sound with real character. Whether it‘s a fat amp or a fine acoustic, the R88 always delivers a great sound – and it sounds as natural as if you were standing in the room. And best of all, with a maximum sound pressure level of 165 dB SPL, the microphone performs brilliantly even with loud sources. So you can even place it directly in front of a guitar amp or drum kit without fear of clipping.

The R88 has become an industry standard for room microphones, especially for drums. Warm, full, and somehow more natural than anything else. «

Kristian Kohle (Kohle Audio Kult):
Metal producer & operator of the Kohle Audio Kult Academy

Anyone who takes metal seriously knows Kohle – and his distinctive drum sounds. For him, the R88 is his first choice when it comes to turning the room into an instrument, for example, in his productions for bands like Powerwolf, Aborted, Electric Callboy, Melechesh, Van Canto, and Benighted. ⁘

www.ribbonmics.com
www.klemm-music.de | 2799 Euro

10 typical microphone pitfalls

and how to avoid them

You have the perfect melody in your head, the killer beat or the unbeatable podcast idea. But then you click on “Record” and... disillusionment. Your vocals sound thin, your speech echoes like in a gym or the sound drowns in a sea of static and indefinable noises. Frustrating, isn‘t it?

Good recordings rarely fail due to a lack of talent or cheap equipment. More often, it‘s due to common microphone errors – and that‘s where Zoom‘s ZDM-1 and ZUM-2 come in. Both supercardioid microphones help you identify and avoid common mistakes – whether in a home studio, podcasting, or capturing spontaneous ideas.

Mistake 1: Ignoring poor room acoustics

Even the best microphone is of little use if the room sounds like a gym. Reverb, echoes or booming bass make the mix unusable.

▶ The ZDM-1 is a dynamic microphone with a supercardioid polar pattern – inherently less susceptible to ambient noise than sensitive condenser microphones. It focuses on the sound source directly in front of it and effectively blocks out noise from the sides and rear. Ideal for untreated home studios or rooms without perfect insulation – for a more direct, more present sound without the need for complex acoustic treatments.

Mistake 2: Too close or too far ... incorrect microphone distance

Too close leads to extreme proximity effect (bloated bass, plosives) and distortion. Too far leads to thin sound, excessive ambient noise, and poor intelligibility.

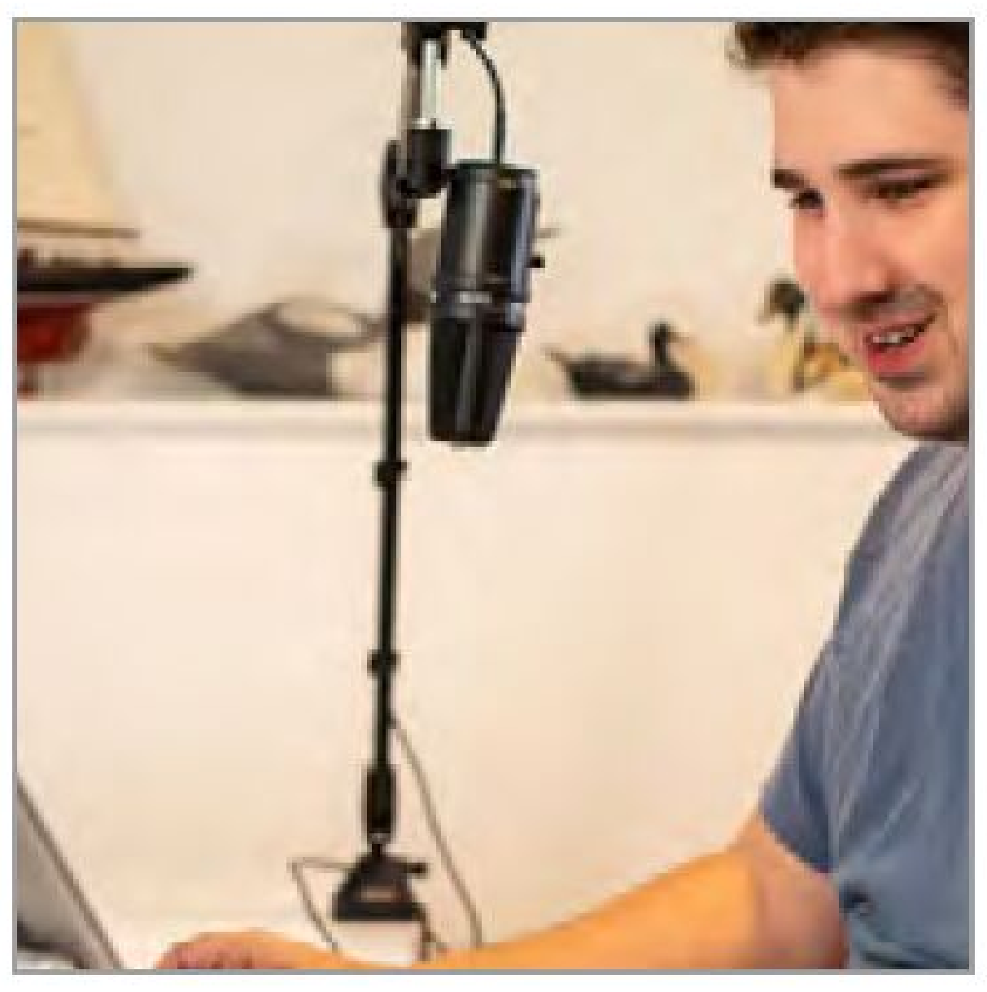
▶ Due to its proximity effect (which is more pronounced with dynamic microphones), it quickly signals when you‘re too close – the bass becomes massive. This provides audible feedback that encourages experimenting with the distance. The optimal distance (often 10-30 cm) for a balanced sound is easy to find.

Mistake 3: Ignoring plosives like „p“ and „b“

Explosive puffs of air when speaking P or B sounds, which sound like a “plop” or “boom” in the microphone.

▶ The ZDM-1 is often sold in a „Podcast Mic Pack“ that includes a pop filter. This is no coincidence! A pop filter is essential for vocal and speech recordings. The recommendation for a pop filter is even more important for dynamic microphones with a strong proximity effect, such as the ZDM-1, as these effects can be more noticeable.

Mistake 4: Incorrect microphone alignment



Microphones have a specific polar pattern (cardioid, supercardioid, omnidirectional, etc.). If you don‘t speak/sing in the „sweet spot,“ the sound will be thin, distant, or indistinct.

▶ The ZUM-2 has a wider polar pattern, but here, too, the front is the sweet spot. The direct connection to the computer and instant control make it easy to experiment with different angles and hear the results.

Mistake 5: Input levels too high or too low

A level that is too high leads to digital clipping, while a level that is too low leads to a high level of noise after amplification.

▶ The ZUM-2 USB microphone has a built-in preamp. You can adjust the level on your computer. This makes the setup more intuitive, as there are fewer hardware steps and you get immediate visual feedback as to whether the level is correct.

Mistake 6: Using the wrong microphone type for the application

Using a condenser microphone for a loud guitar cabinet or a dynamic microphone for very quiet sounds where a condenser would be better.

▶ As a dynamic microphone, the ZDM-1 is ideal for loud sound sources such as vocals, guitar amps, or drums, as well as situations where ambient sound is a problem. A condenser microphone is recommended for quiet sources.

More about the ZDM-1 More about the ZDM-2

Mistake 7: Vibration and structure-borne noise

Noises transmitted by touching the microphone, stand, or table, such as footsteps or tapping on the table.

▶ The ZDM-1 has an integrated shock mount (damping mechanism) that effectively helps to minimize vibration noise.

Mistake 8: No headphones or other monitoring

Without monitoring, you cannot hear how the microphone actually sounds - errors such as clipping or poor positioning are not noticed.

▶ The ZUM-2 often has a headphone output with volume control directly on the microphone. This is super convenient and makes latency-free monitoring extremely easy.

Mistake 9: Incorrect cables and connectors

Improperly installed cables - for example, unbalanced ones for long runs - or incorrect adapters can result in hum, noise, or no signal at all.

▶ The ZUM-2 is a USB microphone and requires only one USB cable. This drastically minimizes cabling errors and makes it user-friendly.

Mistake 10: Lack of gain staging discipline

Turning the gain too high on the mic preamp and then turning it down in the DAW, or vice versa, leads to poor signal-to-noise ratios or unnecessary distortion.

▶ With the ZUM-2, the level is often controlled directly in the system settings of the computer or recording software. This simplifies the process while still making the concept of gain staging relevant.

Image: Universal Audio

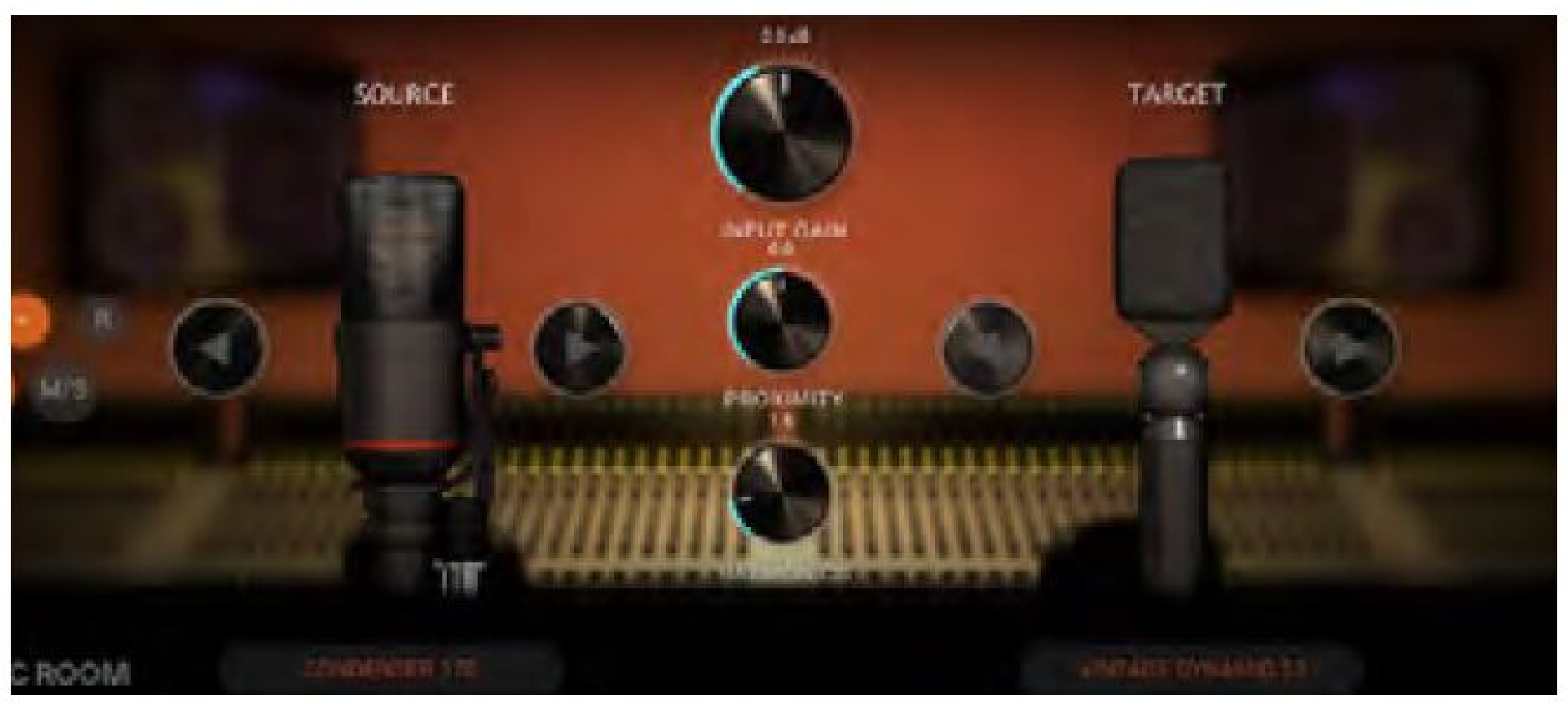
Virtual Microphone Modeling

Classic mics in a box

Virtual microphone modeling systems emulate the characteristics of various studio classics – all for a fraction of the price of the originals. This not only saves money but also saves space. In this article, you'll learn about the different systems available and their advantages and disadvantages.

Neumann U87, Sony C8000, Royer R-121 – many microphones have established themselves as studio classics. But the originals are expensive. Virtual microphone modeling systems (VMMS) offer an affordable, portable alternative with a selection of legendary microphones – purely software-based and ideally latency-free.

A VMMS is a plug-in that recreates the sound character and behavior of famous microphones. To do this, the developers analyze the originals and transfer parameters such as frequency response and distortion into the software. Tube microphone preamps are also modeled. Some systems also allow for polar pattern changes or morphing between models – even after recording.



The „magic“ of emulation happens purely in software – ideally latency-free.

Boring microphone

For the best possible results, it's usually best to use a microphone from the manufacturer that matches your needs. Unlike studio microphones with their own coloration, VMMS microphones are deliberately „neutral“ to give the plugin complete freedom to shape the sound. Some systems also support standard microphones like the SM57 – but dedicated modeling microphones deliver more accurate results.

A tuned modeling microphone like the Sphere DLX from Universal Audio offers a more authentic emulation.

Advantages and disadvantages of VMMS

The advantages of a VMMS are clear: inexpensive, space-saving, and flexible. Many of these tools aren't just strict emulations, but also allow for creative freedom with modern features like changing the polar pattern and morphing. Furthermore, the various models can be changed even after recording, allowing you to listen to them in peace. The disadvantages are that a VMMS without DSP support may generate too much processing power, i.e., latency, for live use. Hardware enthusiasts will also argue that the influence of analog components, such as heat and other parameters, affects the sound, which is often difficult to emulate.

Slate Digital: The ML-1A from Slate Digital is a dedicated VMMS microphone with zero-latency software. It includes 18 emulations, two of which can be morphed. There are also parameters for stereo width and proximity effect. Expansion packs allow for up to 36 models.
www.slatedigital.com | 649 Euro

Universal Audio: Universal Audio offers two VMMS microphones, the Sphere DLX and LX. The software runs latency-free on Apollo interfaces. The LX provides 20 emulations, the DLX 38, and, thanks to its dual capsule, also enables stereo recording. Both systems allow subsequent adjustment of polar pattern, proximity, and ambience. Expansion packs are optional.
www.uaudio.com | 1307,81 Euro (Sphere LX), 1962,31 Euro (Sphere DLX)

Antelope Audio: With six modeling microphones, Antelope Audio offers the most comprehensive catalog in the VMMS sector. The Edge series, including the Axino Synergy Core, covers a variety of applications, including USB models. The most flexible model is the Edge Quadro: The upper capsule is adjustable, and dual diaphragms enable stereo and 3D recordings. The polar patterns of both capsules are separately selectable. 18 emulations are available.
www.antelopeaudio.com
2495 Euro (Edge Quadro),
other models starting at 149 Euro

IK Multimedia: Mic Room is a pure software modeling plug-in without a dedicated microphone. The 20 emulations can be adjusted for proximity and saturation. Some models also serve as input source selection – e.g., the SM57. If your mic isn't available, select a similar one, and the software will adjust the parameters accordingly.
www.ikmultimedia.com | 59,49 Euro

Antares Mic Mod: Mic Mod offers over 100 microphone emulations – the largest selection of all the tools presented. Here, too, you can adjust proximity, saturation, and polar patterns. Source and destination models sometimes overlap, and generic input options are available as an alternative.
Info: www.antarestech.com | 137 Euro ⁘

Microphone accessories

This gear improves the sound of your microphone!

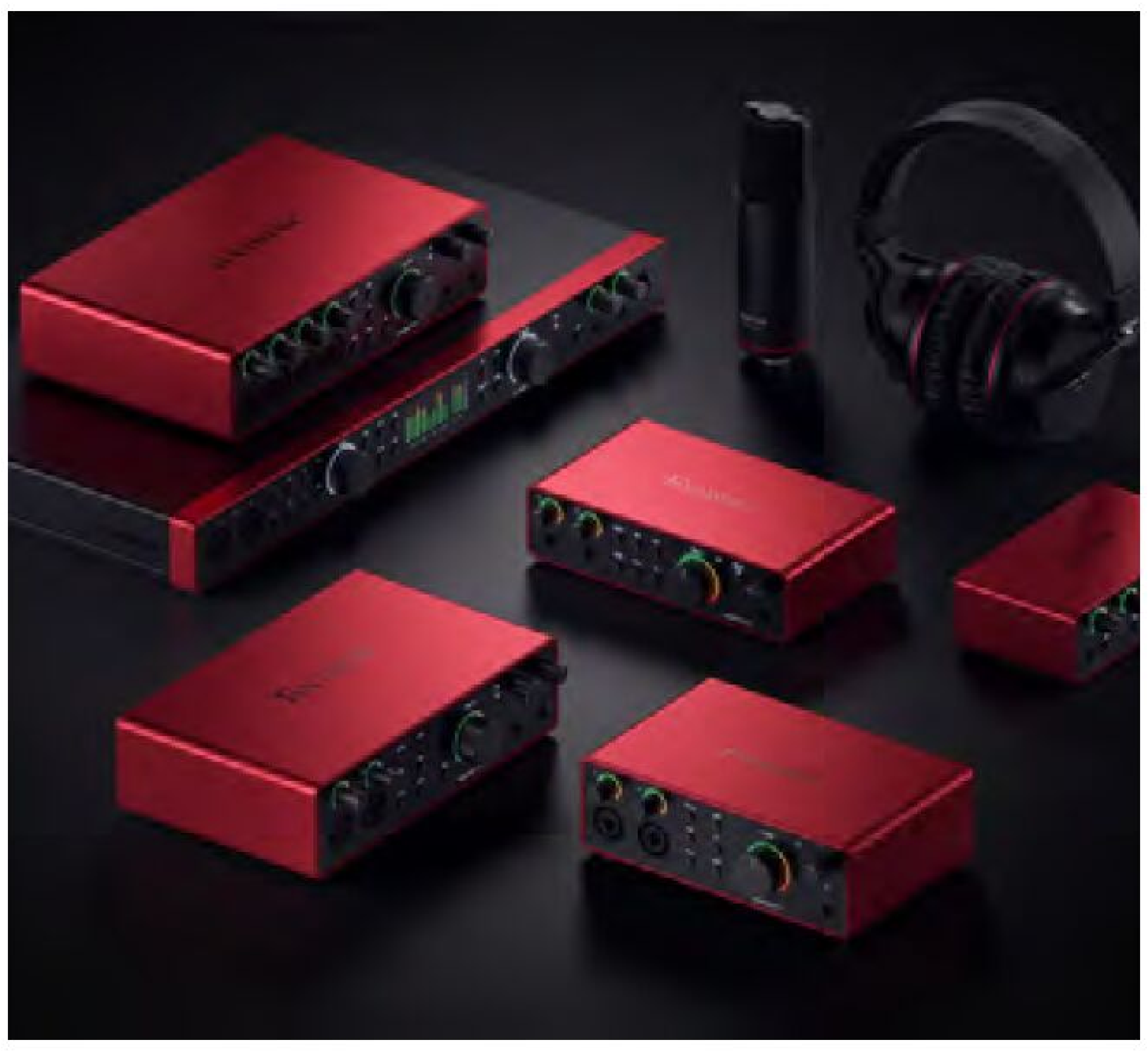
A good microphone alone is rarely enough. Just getting the recordings „into your computer“ requires an audio interface and a cable. A good tripod, pop filter, or shock mounts can contribute significantly to noise-free recordings. And if you want a premium sound, an additional preamp can be useful.

USB microphone vs. audio interface

Of course, there‘s a very simple scenario where you use a USB microphone for podcast recordings, complete with a tabletop stand and USB cable. But if you want to record vocals instead of speech, where there are much larger dynamic ranges between quiet whispers and roaring growls, a shock mount and a pop filter can be a real help.

Shure MV7+ - available in two colors, image: Shure

And while USB microphones are practical, they are also limited when it comes to recording more than one microphone at a time, amplifying headphones well during monitoring, or reducing the load on the DAW you‘re recording in. These are all reasons why an audio interface is the better choice in almost every scenario other than podcasting.

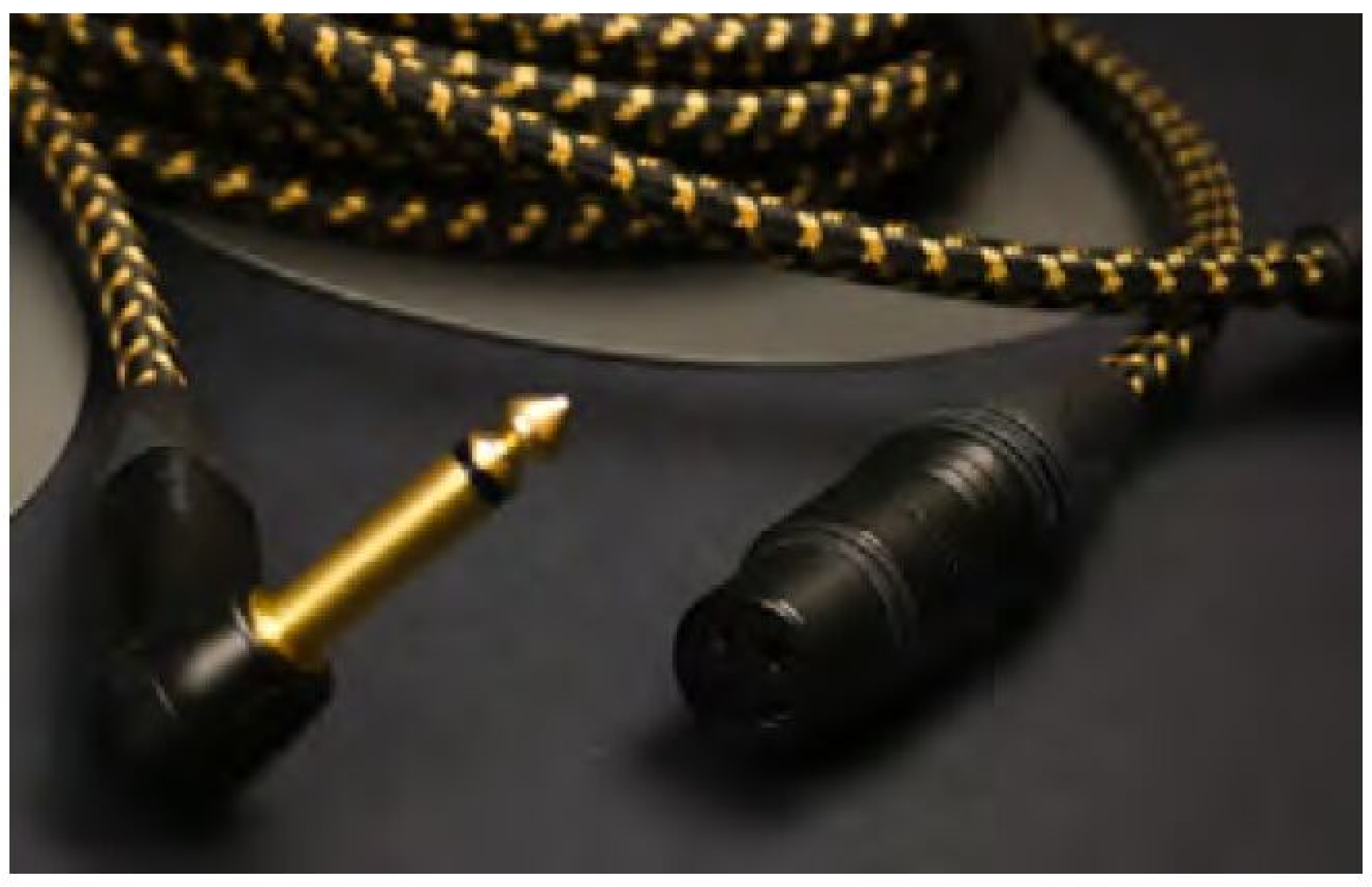


The Focusrite Scarlett family, source: Focusrite

Even small entry-level solutions such as the Scarlett series from Focusrite or the small interfaces from SSL (SSL 2 and SSL 2+) can be completely sufficient.

Cables and stands

Many people cut corners on cables and stands in the first few years – but this is unjustified. A higher-quality XLR cable is better shielded against noise, more robust (= fewer loose connections and cable breaks), and often doesn‘t cost much more. Cordial, for example, offers many cable lengths, all with high-quality workmanship.



High-quality cables from Cordial, image: Cordial

The same applies to tripods. If you use a cheap model and tend to forget to loosen the screw before adjusting the arm, you‘ll sooner rather than later experience the notorious microphone wandering.

Of course, the first habit you should get into is to loosen the screw before adjusting the arm, then adjust it to the desired height, and then tighten the screw again. But higher-quality tripods often hold more weight, for example, a bulky large-diaphragm microphone in an angled position when recording an acoustic guitar. In this case, the tripods from König & Meyer (K&M) are particularly stable and durable.

Pop filter and shock mount

If you look into the studios of many content creators, you‘ll often see a microphone in the frame, but rarely a pop filter. This is partly due to the fact that hardly anyone holds the microphone directly in front of their face, but rather at an angle from the side toward their face. While this might be fine for voice recordings at distances between 20 and 30 cm, it becomes problematic for delicate vocal recordings ranging from whispers to screams.

Pop filter by RØDE
Image: RØDE

If the microphone isn‘t pointed directly at the mouth, the sound will be unclear. Conversely, it‘s quicker than you think for a singer to sing a round of „Perfect Place of Permanent Pudding,“ and all the clipping warning lights will flash. Especially with louder vocals, so-called plosives or „p“ sounds can cause unpleasantly loud „p“ sounds in the recording due to the sudden expulsion of air.

Pop filters are available for this purpose; they can be attached to the microphone stand below the microphone and then positioned between the singer and the microphone. The thin foam ensures that the explosive „ps“ are gently dampened. As for shock mounts or microphone shock mounts, these are often included with large-diaphragm microphones. The rubber band suspension compensates for minor vibrations caused by fidgety singers or hip-swinging guitarists, and they no longer appear as annoying rumble on the recording.

Preamps – for weak microphones and premium studio sound

Opinions differ when it comes to preamps like the legendary Neve 1173 or the Avalon VT-737SP. For many studio engineers, they are the ultimate in premium microphone sound. Many home recorders often ask themselves: Why are they necessary when I‘m using my interface? On the one hand, there are microphones like the ultimate podcast microphone, the Shure SM7b, which require more amplification than interfaces can often deliver without noise. Preamps like the ones mentioned above not only make the signal louder, but can also add a distinctive color to the sound.

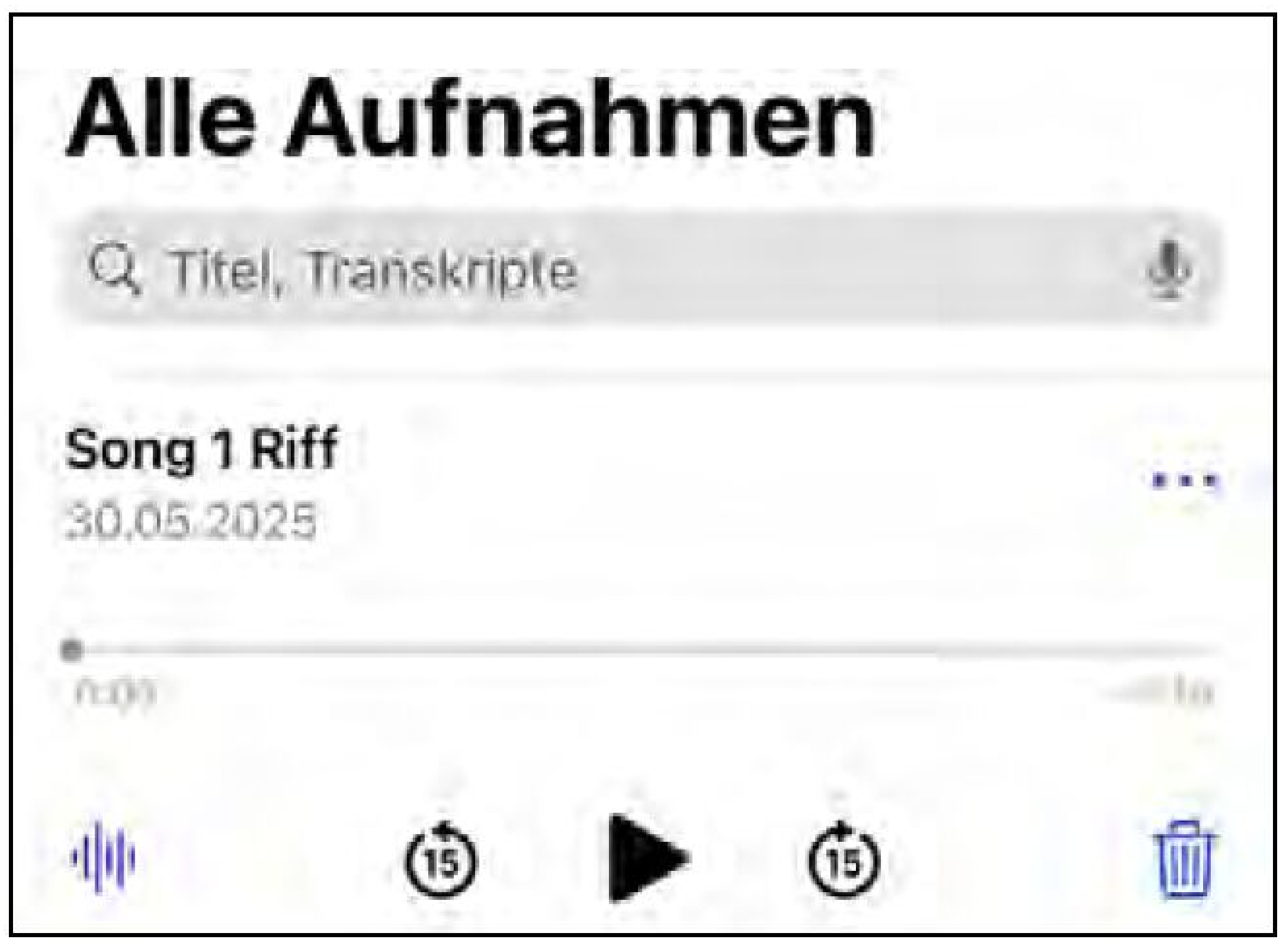
Low budget recording

When smartphone and laptop are sufficient for recording

If you ask major producers, the „voice memo“ is a common topic. It‘s not uncommon for vocal or sometimes even guitar recordings made directly in the moment of creation to be unattainably good in terms of performance and feel. However, the built-in microphones on today‘s smartphones and laptops are also good enough these days. But for what purposes are they sufficient?

Demoitis

There‘s a dreaded problem among bands and band producers: demoitis. Demos, or song sketches, often best capture the initial, raw feeling, especially when it comes to vocals. You can get hooked on that. And then chase it for weeks, even months, during production – demoitis.



Alle Aufnahmen

Titel, Transkripte

Song 1 Riff
30.05.2025

Sketches, riffs, and demos from the smartphone memo app.

While not so long ago, you were condemned to doing just that, in recent years the quality of microphones in smartphones and laptops has improved so much that the number of productions where at least parts of the demo vocals from the Voice Memo app end up in the finished recording is growing. Even with acoustic guitar recordings, there are always productions where the small iPhone wins out over the expensive Neumann microphone – if the arrangement allows it.

When a smartphone and laptop microphone aren‘t enough

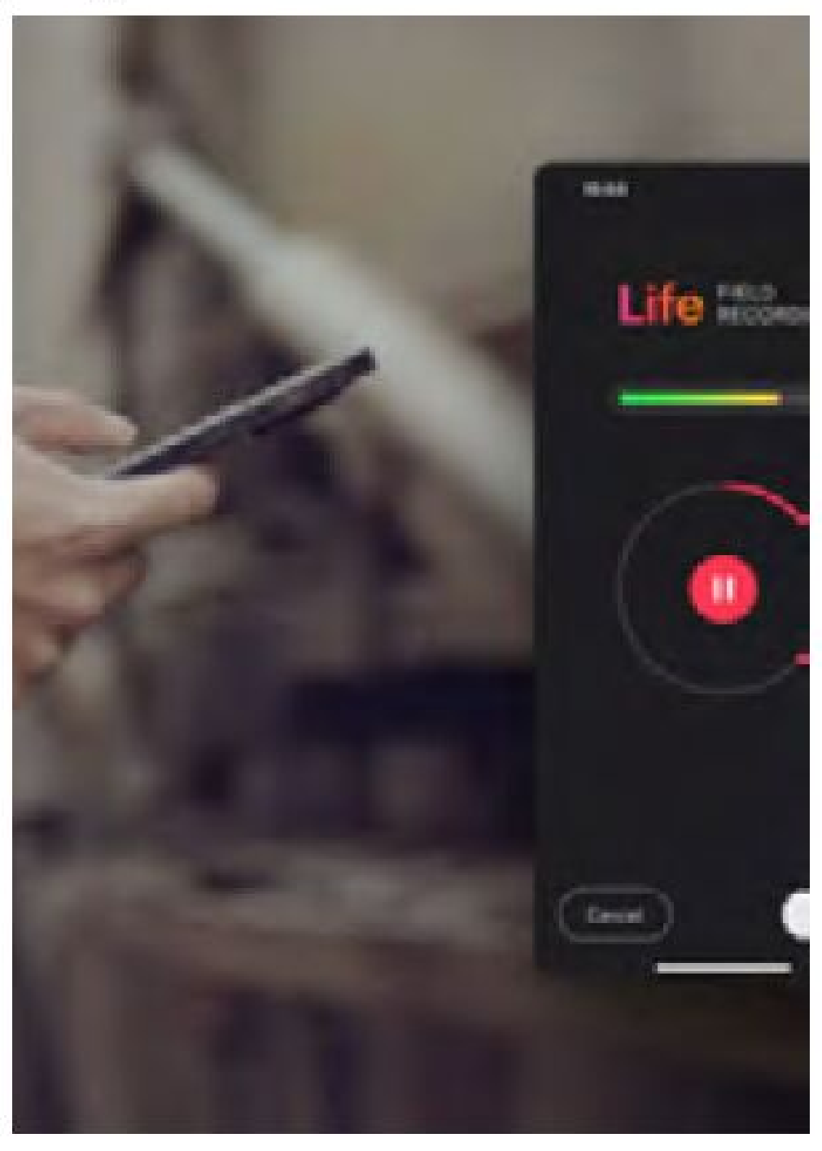
To avoid any misunderstandings: this excursion into low-budget recording is not intended as an excuse for poor-sounding recordings. But especially when things get loud and low-frequency, such as drums, bass, or electric guitar, the laptop or smartphone can at best serve as an experimental room microphone in the corner.

More detail and low frequencies with a microphone like the SM57 from Shure. Image: Shure

Even in sparse arrangements, such as folk music or a pop ballad, where the focus is even more on the vocals and acoustic guitar, the frequency ranges (above 100 Hz and below 12 kHz) for which these miniature microphones, primarily geared towards speech, are particularly noticeable. Such a recording can then sound too thin or muffled in the mix.

Background vocals, spoken word, and percussion

If the arrangement is fuller, with a variety of synths, drums, and effects alongside the vocals, it‘s easy to capture ideas directly with a smartphone or laptop microphone. For example, I recently spent half an hour clapping around my laptop on a track that needed rhythmic background clapping (the neighbors must have been surprised!). For a background element, that was perfectly sufficient.

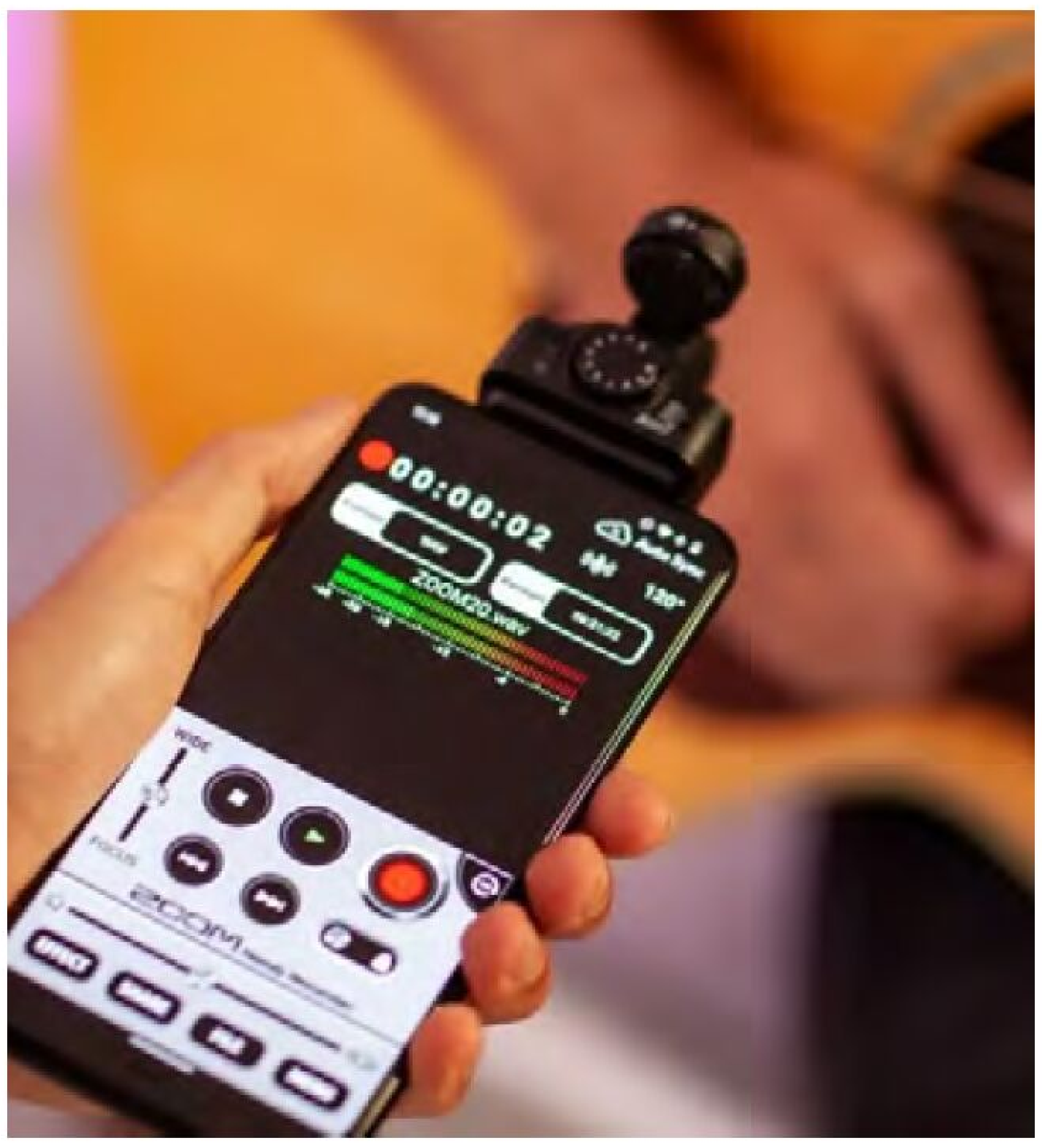


The XLN Life app makes field recording on a smartphone particularly easy by connecting directly to a VST plug-in.

Even if you want to record a few ad libs for the rap verse, your smartphone and its voice memo function can be quite sufficient. Ad libs are often edited so heavily and pushed into the background that they don‘t necessarily sound good.

Lo-Fi and Ambient

All variations of lo-fi and ambient are perfect for (slightly!) poor-sounding recordings. These can be blurred with effects. This way, the next train ride home, waiting for the bus, or even a lunch break in the garden at home can instantly become a source of effects sound via smartphone or laptop.



A clip-on microphone, such as the Zoom AM-7, significantly improves recording quality on a smartphone. Image: Zoom

Post-production tools such as Izotope RX or Steinberg Spectrasonics are getting better and better. These can remove the most glaring noises, especially if your neighbor had to mow the lawn during a spontaneous vocal recording. And once you get used to recording on your smartphone, you can sooner or later upgrade the built-in microphone with better clip-on microphones such as Zoom‘s AM/IQ series. ⁘

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The cult synth is back! Albino-3 Legend brings the virtual analogue sound of the early 2000s into the present – now with VST3 and NKS support, scalable GUI and optimizations for modern systems. With four layers per preset, creating massive, complex sounds is a breeze – perfect for fat leads, lush pads, and intricate soundscapes!

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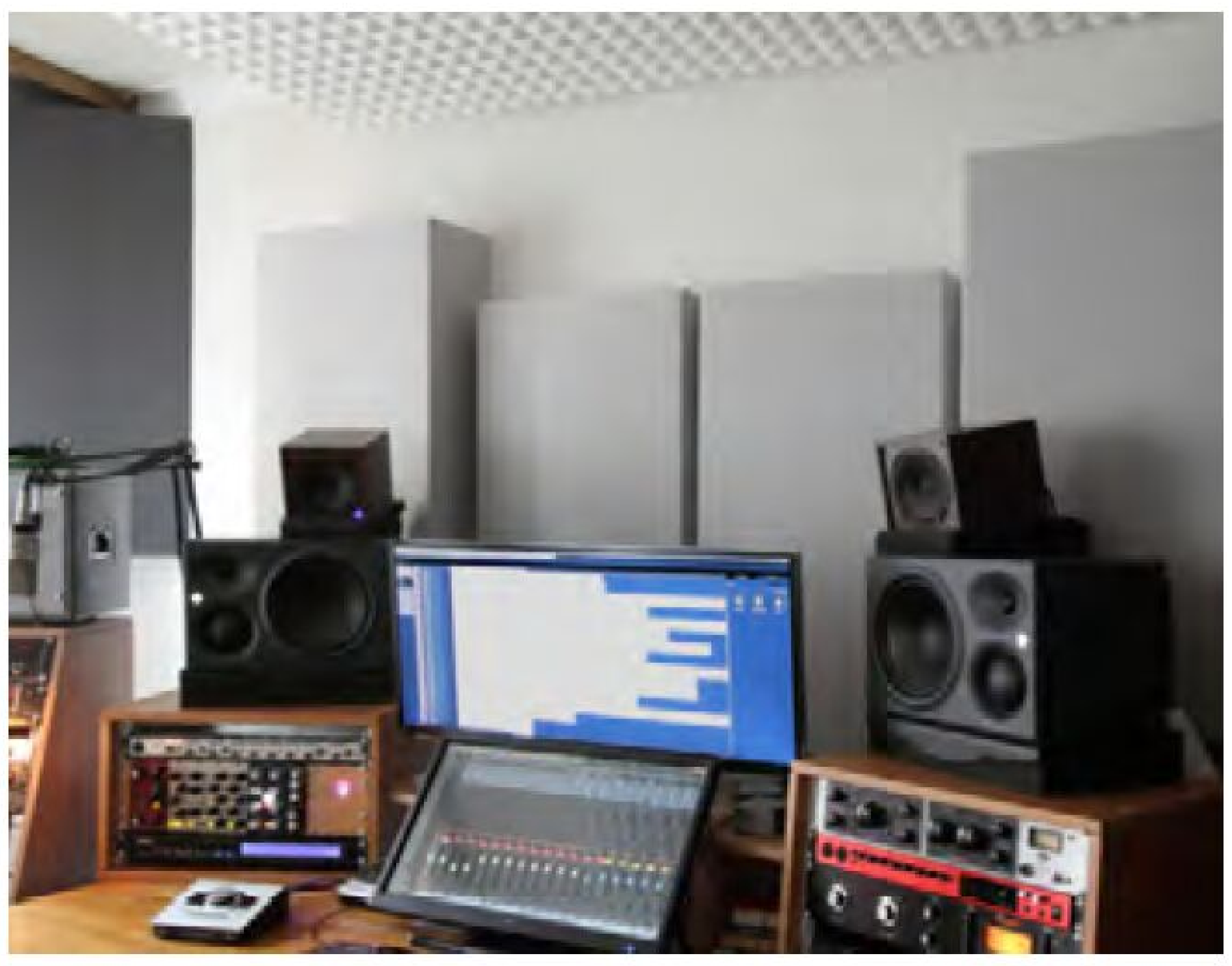
Microphone setup

What to consider when recording vocals & speech!

Set up the microphone, connect the cable, start recording in your DAW – off you go. If only it were that easy! This is where you often encounter unpleasant surprises if you haven‘t familiarized yourself with microphone setup, i.e., the correct positioning of a microphone. Too quiet, too much space, too indirect, too distorted – but before you spend hours trying to salvage what you can with post-production tools like Izotope RX, good microphone setup is much more likely to achieve your goal. The right distance, the right height, the right position in the room – and your recordings will sound better!

Microphone placement vs. room acoustics

Along with background noise, the biggest enemy of poor vocal and speech recordings is the room acoustics. Let‘s assume we‘re recording in a reasonably quiet room. In such a case, room modes (resonances caused by parallel walls) can make even the best recordings unmixable.



Diffusers and absorbers improve room acoustics – even during recording. Image: Neumann

A few tests at different positions in the room are worthwhile. Sometimes, in a home studio, it‘s enough to find the spot in the room where the voice, microphone, and room sound best. Placing blankets or sheets over reflective surfaces like windows and doors can often quickly reduce reflections.

Vocal vs. speech recordings

You might assume that miking is the same for speech and singing. While speech is usually recorded consistently and in a controlled manner, vocals require a much wider dynamic range. Content creators, on the other hand, usually speak at a constant level—not whispering, shouting, or growling like with vocals. In other words, direct contact is often desired when recording speech with dynamic microphones—for clear, low-noise sound.

A highly directional microphone, such as the Shure SM7b, can deliver good results even at greater distances. Image: Shure

Upside down or not?

Don‘t worry, you don‘t have to hang from the ceiling like a bat. It‘s common practice to position the vocal microphone upside down, with the capsule pointing downwards, in the area between the singer‘s upper lip and nose – at a distance of about 20 to 30 cm. This way, loud breaths and plosives (see pop filter) are captured less loudly.

It‘s extremely important not to establish a rule that applies to all voices and vocal styles. If you record more than just your own voice, you‘ll quickly notice how different the microphone type, position, and room position can be depending on the vocal tone and vocal style. So here‘s another tip: Take the time to make test recordings with the singer. Even if you only have one microphone available: if you don‘t have an acoustically isolated vocal booth, you‘ll have to wander around the room.

Headphones or speakers

The primary goal when recording vocals is to capture a performance that fits the song. This can quickly go out the window for singers using headphones. Especially in louder genres and with full arrangements, you can sometimes get a much more intense performance out of stage hogs and rehearsal room habituals by placing them in front of loudly turned-up monitor speakers with a dynamic microphone. Even greats like U2 and Michael Jackson have used this technique, and in many songwriting camps, it‘s common practice to simply have an SM7b in the room. Although its narrow polar pattern does cause some crosstalk, this is often minimal compared to vocals.

Drums – a science in itself

Besides guitar, bass, and vocals, drums are the most frequently miked instrument. However, due to their dynamic nature, they are also the most difficult to capture. While in the 1950s it began with one or at most three microphones for a drum kit, by the 1980s and 1990s it had become widespread to record every drum, and sometimes every cymbal, from at least one side, along with a few small- or large-diaphragm microphones as so-called overheads, which acoustically capture the entire set from above.

In addition, sound was created by strategically distributed room microphones. This effort alone, this number of microphones, and the influence of the room acoustics are reason enough for the success of Superior Drummer, Addictive Drums, Steven Slate Drums, and more. But even here, surprisingly good results can be achieved if you look at old miking techniques (keyword: Glynn Johns), where sometimes three microphones were sufficient.

Completely uncomplicated

Guitar and bass recording

Guitar and bass are now incredibly easy to record – whether via cable directly into an audio interface or with modern amp modelers like Kemper and others. However, if you want something a little more authentic or want to get the most out of your sound, you can‘t avoid using a microphone. The following section explores the various miking options for acoustic and electric guitars and basses – along with practical tips.

Acoustic guitars and basses

If the guitar or bass has a pickup, the signal can be sent directly to the interface. This solution is practical and low-noise, but it often sounds a bit artificial or thin—especially with cheaper pickups. It also makes on-the-fly effects processing easier. For a more natural and high-quality sound, recording with a microphone in a good-sounding room is usually the better choice.

There are several options for miking. A classic option is to position the microphone in front of the sound hole, about 30 cm away. This creates a round, full sound, although we sometimes need to thin out the lower mids a bit with the EQ. Alternatively, the microphone can be placed about 10 cm in front of the bridge - where the strings are attached to the body. The top is thinner here and resonates particularly finely, resulting in a more detailed sound.

Suitable microphones include the AKG C451, Sennheiser MKH50, Beyerdynamic MC930, or Neumann KM184. In principle, any good condenser microphone will work – whether large- or small-diaphragm. If you have two identical microphones available, you can create a stereo recording using the AB method: One microphone is aimed at the sound hole, the other at the bridge, both as parallel to each other as possible. In the mix, the signals can then be panned hard left/right or slightly narrower, depending on how much width is desired.

Small diaphragm microphones such as the KM184 from Neumann are also well suited for recording acoustic guitars.

Tip: A more phase-stable alternative is the XY method, in which the capsules intersect at a 90-degree angle. Special stereo rails are available for this purpose, which can be mounted on a microphone stand.

Electric guitar and electric bass

If you want to record guitar or bass through a real amp, it‘s best to do so in an environment where volume isn‘t a problem – tube amps in particular only reveal their full character at the appropriate level. The cabinet also has a strong influence on the sound, but to avoid making things too complicated, we‘ll assume that you have a well-tuned setup – and the only question is: How is it mic‘d?

It‘s a good idea to split the guitar signal before the amp – for example, with a DI box or splitter like the Radial J48 or the Palmer PAN01. This also allows you to record a clean DI signal that can later be reamped or processed with plug-ins – giving you maximum flexibility.

The cabinet should be about 25 to 30 cm above the floor and be as mechanically decoupled as possible. Then you need to adjust the amp carefully – please don‘t rush into recording. Small details often make a big difference.

Depending on how many speakers are installed in the cabinet, one or more microphones can be used. With the latter method, it is essential to pay attention to the phases and distribute the tracks on one side of the panning – a double track is used on the opposite side. In practice, however, one or two microphones are usually sufficient. Speakers in the lower part of the cabinet often deliver more low-mid frequencies – microphones such as the Sennheiser MD421 or the Electro-Voice RE20/RE27 are suitable for this. For brighter signals at the upper speakers, classic microphones such as the Shure SM57, SM58 or the Sennheiser MKH50 can be used. The closer the microphone is positioned to the diaphragm, the more direct and drier the signal sounds. With increasing distance, the amount of surround sound also increases – what sounds better depends on the room and the musical context. The ideal sound is ultimately always subjective.

Predestined for guitar and bass recording: the MKH50 from Sennheiser

The best way to find the optimal microphone position is to have a second person move the microphone in small increments while you listen through headphones or studio monitors. For additional low-end, a large-diaphragm microphone can be placed on the back of the cabinet, which can then be subtly mixed in. With electric bass, it‘s often common practice to record directly via DI. This usually delivers a solid signal with sufficient low-end and doesn‘t require a microphone. Exceptions are amps that contribute significantly to the sound, are deliberately driven into saturation, or are located in a particularly good-sounding room.

Tip: If you don‘t want to drive your neighbors crazy but still don‘t want to miss out on the organic sound of a loud tube amp, you can opt for a hybrid solution consisting of a speaker simulator and a load box. This is connected to the amp instead of the cabinet, serves as an artificial load, and enables silent recording. Examples: Palmer PGA04 or Two Notes Torpedo Captor X. ::

Suitable for splitting signals: the Palmer PAN 01 DI box.

Palmer
AUDIONOMIX
DI BOX
PAN01
PASSIVE
INPUT
LINK OUT
BALANCED OUTPUT
LIFT GND

Put an end to microphone frustration

Rethinking the pop filter

In the signal chain of a vocal setup, the pop filter plays an inconspicuous yet pivotal role: It's the first component the voice encounters – even before the microphone, preamp, or plug-in. The team at Pop Audio asked themselves why we have the highest standards for microphones, interfaces, and plug-ins, yet make compromises at the very first link in the signal chain.

Why the Pop Audio pop filter deserves a second look

Pop filters are often a source of despair. Wobbly, dangling arms, rickety clamps, sound-draining materials – you know the drill. Pop Audio demonstrates that there's another way with a concept that clearly distinguishes itself from classic gooseneck filters in terms of technology, sound, and feel. And so, a pop filter was created that not only works, but also no longer causes you any problems while recording.

Three filters – the right solution for every recording situation

Whether aggressive rap vocals, dynamic vocals, or whispering voiceovers: every recording style places different demands on the pop filter. Instead of committing to one solution, the Pop Audio Studio Set comes with three acoustically transparent filters that you can swap out in a snap.

Foam:

The advantage of the hydrophobic foam version is particularly evident in critical recording situations. It offers very clean impulse response and effectively dampens air blasts without audible coloration in the high-frequency range. This allows for maximum transparency, especially with high-quality condenser microphones.

Fabric:

The modern classic: double-layered fabric with optimal protection against air blasts. This version provides the typical, slightly soft vocal sound and is perfect for singer-songwriter recordings, podcasts, or voice recordings.

Metal:

Two perforated metal discs ensure stability, durability, and easy cleanability. In our tests, the signal appears slightly brighter than with the fabric filter, but remains just as well protected against plosives. This version scores with a very direct sound. A favorite for live streaming, touring, or home studio use.

Arm and clamp: mechanics with substance

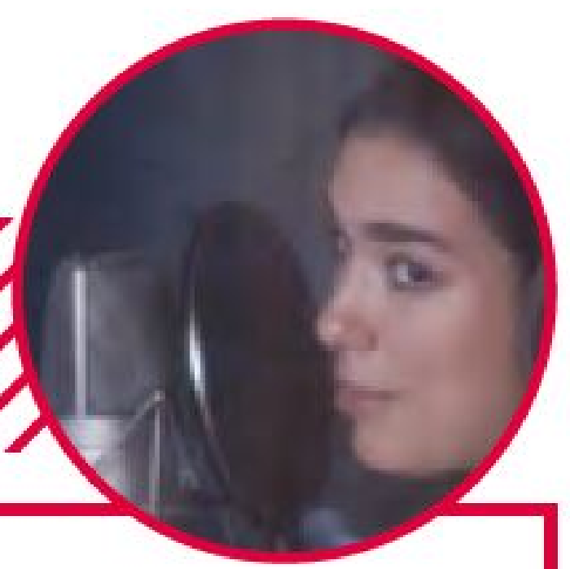
The highlight: the filters are not screwed or clamped in, but can be changed quickly using a bayonet catch. Instead of brittle plastic, you get an aluminum butterfly clamp with a non-slip rubber cover that grips reliably but does not damage microphone arms or stands. The attachment is suitable for various tube diameters and stays firmly in place, even after several weeks of studio use.

Many pop filters rely on classic goosenecks until they fall to the ground after two takes. Instead, the Pop Audio Arm uses an innovative ball-and-socket joint system that can be flexibly adjusted and remains stable. Once positioned, the filter holds its position no matter how often you record or move the microphone.

Verdict

Pop filters are rarely the most exciting topics in everyday recording, but they can make the difference between a good and a perfect take. Pop Audio delivers a coherent overall package that's sonically impressive, mechanically sophisticated, and simply works in practice. It's not a gimmick, but a tool you'll enjoy using every day – and probably never need to replace. Whether you prefer foam, nylon, or metal, with this set you're equipped for any recording situation. ⁘

CELEBRITY FACTOR



The system has also become established in professional studios: Ed Sheeran, Dua Lipa, Carrie Underwood, Lewis Capaldi, and Beyoncé work with the Pop Audio pop filter. The filters' transparency pays off, especially with sensitive vocals or heavily compressed voices. Photo: RAK Studios

www.popaudio.co.uk | www.sonic-sales.de

Pop Audio Studio Set

Ball-jointed gooseneck with a length of 324 mm
Foam, fabric, and metal filters
Robust, rubberized quick-release clamp
Bayonet mounting mechanism
Adapter thread for various stands
Pop filter diameter: 157 mm
Price: 99 Euro

The right microphone for the job

3 tips for better recordings

Whether it‘s vocals, acoustic guitar, or piano – every signal needs the right microphone to shine. Starting with the right capsule will save you a lot of work later in the mix. We‘ll show you three typical recording scenarios and three models from sE Electronics that are particularly well-suited for them.

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sE
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V7
sE
sE7
sideFire
sE
sE4400

1

V7 G-25AE: A golden age for your voice

Whether it‘s rap, soul, or rock: If you want to make a statement with your voice, you need a microphone that can do just that. The sE V7 G-25AE is a dynamic vocal microphone with a supercardioid polar pattern that delivers excellent results even in live situations. It‘s no wonder that well-known artists like Billie Eilish, In Flames, and Justin Timberlake rely on this model for live performances.

The aluminum moving coil ensures clear mids and crisp highs, and the patented decoupling noticeably reduces handling and impact noise. What‘s special: This special 25th anniversary edition is coated in 24-carat gold – a visual statement with sonic substance.

Tip: The V7 Gold is also a good choice for podcasts, speech, or vocal booths with limited room space, thanks to its strong directional characteristics and feedback resistance.

V7 G-25AE: Uncompromising on stage

- Ideal for powerful, dynamic voices
- Supercardioid polar pattern for minimal crosstalk and high feedback resistance
- Direct sound thanks to aluminum moving coil
- Quiet during movement: Patented decoupling against handling and impact noise
- Extremely robust: Full-metal housing with anti-roll protection and gold-plated contacts

Price: 229 Euro

2

Guitar or snare? The sE7 sideFire fits anywhere

With a side-mounted capsule design, the sE7 sideFire brings a breath of fresh air to the small-diaphragm segment. This allows for exceptionally flexible placement, e.g., at the sound hole of an acoustic guitar, on a drum set, or in field recordings. Sonically, it is based on the proven sE7 original – low-noise Class A electronics, a switchable -20 dB pad, and a low-cut make it extremely versatile. The impulse response is precise without being harsh. This is a real advantage, especially with percussive material such as snares, toms or flamenco guitars.

Tip: Try pairing them in XY for drum overheads or as underheads for a realistic sound. The sideFire is ideal for this and is also available as a stereo set.

sE7 sideFire: Small, clever, powerful sound

- Maximum flexibility for studio and stage: For acoustic guitar, snare, brass, piano, and more
- Lateral design: 90° capsule for creative miking n tight spaces
- Fine detail and quiet: Class-A electronics with very low self-noise
- Dynamic talent: Switchable -20 dB pad for loud instruments
- 80 Hz low-cut filter to reduce impact noise and rumble
- Stereo-ready: Also available as a matched stereo set with perfect phase coherence

Price: 149 Euro

3

Stereo sound for big moments: sE4400 Stereo set

Do you want to mic up a piano? Or do you need a flexible solution for vocals, room sound, and strings? Then the sE4400 Stereo Set is worth a look. This large-diaphragm condenser microphone is based on the popular sE4400a – but has been refined in every detail.

Four switchable polar patterns (omnidirectional, cardioid, hypercardioid, figure-8), two pads, and a two-stage low-cut make this microphone a versatile tool for almost any recording context. Despite its large diaphragm, it‘s slim enough to fit close to amps, drum heads, or instrument bodies.

Tip: This stereo set is perfect for Blumlein or ORTF configurations. It delivers a natural, balanced stereo image, with pleasant treble definition and a rich foundation, especially for pianos, choirs, or room recordings.

sE4400: Discreet in appearance, powerful in sound

- Studio all-rounder for voices and instruments: Whether vocals, choirs, kicks, or strings
- Extremely versatile thanks to dual diaphragms
- with omnidirectional, cardioid, hypercardioid, and figure-8 pickups
- Compact design: Ideal for tight microphone positions on amps, drum heads, and vocals
- Clear sound, powerful level: Two pads (10/20 dB) and switchable low-cut (40/80 Hz)
- Cast metal housing, spring steel basket
- Stereo capability: Also available as a matched pair

Price: 1049 Euro

Verdict

Whether you‘re performing solo, in a singer-songwriter setup, or using stereo microphones: With the right microphone, many things are easier. The three models from sE Electronics demonstrate how much sound quality, flexibility, and practicality are possible today in the mid-price range. And best of all: All three microphones are robust, well-designed, and simply sound great – regardless of whether you‘re recording, streaming, or performing on stage.

www.seelectronics.com | www.megaaudio.de

Beat

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